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

VOL. X.

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

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IN THIRTY-NINE VOLUMES.

VOL. X.

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.

CORNEA.

CORNEA-TUNICA, in *Anatomy and Optics*, is a dense, strong, and transparent membrane, occupying the vacancy which is left by the sclerotica in the front of the eye-ball. See **EYE**.

It is situated in the sclerotica. Dr. Porterfield considers both these as one and the same tunicle, expanded from the external coat of the optic nerve about the whole globe. It has a greater convexity than the rest of the globe of the eye, forming, according to M. Petit, a portion of a sphere, whose diameter is usually $7, 7\frac{1}{4}$, or $7\frac{1}{2}$ lines; its chord, or, which is the same thing, the diameter of the iris, including the thickness of the cornea, commonly measures $5, 5\frac{1}{4}$, or $5\frac{1}{2}$ lines. The distance betwixt the centre of the cornea and the crystalline lens, measured on the axis of the eye, from the outside of the cornea, is $1\frac{5}{12}$, from which deducting $\frac{2}{12}$, which is the thickness of the cornea itself, there remains $1\frac{1}{4}$ for the thickness of both chambers of the aqueous humour. Others have given to the cornea the figure of the vertical part of a parabolic or hyperbolic spheroid. Although the cornea is more protuberant than the other parts of the eye and elevated above the spherical surface of its opaque portion called sclerotica, this protuberancy is different in different animals. In birds it is much more elevated and convex than in either man or quadrupeds. This convexity of the cornea serves like that of a convex lens, as it is part of a lesser or greater sphere, to make objects appear greater or less, more remote or nearer. But as it is the use of the cornea, and of the aqueous humour which lies behind it, to commence the refraction of the rays of light, which is afterwards completed by the crystalline and vitreous humours, it may be asked how it comes to pass, that the great convexity of the cornea in birds does not render their sight confused and indistinct, by increasing

the refraction, and making the rays meet at some point before the retina, just as in the case of myopes or short-sighted persons, who never see objects distinctly at an ordinary distance, because the cornea, by its too great convexity, makes the rays convene too soon behind the crystalline? To this inquiry it is replied, that this great convexity of the cornea of birds is absolutely necessary for distinct vision; because, as in men and quadrupeds the figure of the eye is almost spherical, so in birds, as well as in fishes, it is flat and depressed, both in its fore and back parts, by which means the retina is placed near the crystalline humour; and, therefore, if the convexity of the cornea did not correspond to the flatness of their eyes and the distance of the retina, the distinct image of visible objects would fall behind it, and the sight would thus be rendered confused and imperfect, like that of the presbyta or old men, who cannot see objects distinctly, especially at a small distance, on account of the flatness of their eyes in proportion to the distance of the retina; and therefore nature has wisely provided, with a view to the perfection of the organs of animals, that the convexity of the cornea should be increased in those creatures which have the retina brought near to the crystalline by the flatness of their eyes; for, being thus enabled to see objects distinctly at an ordinary distance, they can, by changing the conformation of their eyes, adapt them to all other distances, as necessity requires. In men and quadrupeds, both the sclerotica and cornea, though of a dense compact substance, are nevertheless soft, flexible, and yielding, like other membranes. But in birds and fishes the sclerotica is altogether inflexible, being generally harder than a cartilage, and in some quite bony; whence it seems manifest, that in these creatures the change of the conformation of the eye, by which it is adapted to the different dis-

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rances of objects does not arise from any change in the figure of the eye itself proceeding from the action of its muscles, as Dr. Porterfield imagines, though many have thought otherwise; the hardness and inflexibility of the scleroticum being repugnant to any such change of figure. This change of conformation therefore must proceed, as he conceives, from some other cause, such as the contraction of the ligamentum ciliare. In fishes, insects, and all animals that want eye-lids to cover and defend their eyes, the cornea also is of a firm hard substance, as Fabricius ab aquapendente has observed; and this was necessary, that it might not be hurt by particles to which, for want of eye-lids, they are exposed. This is particularly to be observed in crustaceous animals, such as the locusta, gammarus, cancer, &c. to which eye-lids, instead of being necessary, would have been hurtful, and an impediment to their sight, on account of their hardness and difficulty of motion; and therefore nature has contrived another method for securing their eyes against external injuries, by the hardness of the cornea, which, in these animals, exactly resembles the form of a lantern. In other animals that want eye-lids, the cornea is also firm and hard, though not so firm as in crustaceous animals. But, in all animals that are provided with eye-lids for guarding and defending their eyes, such as men, quadrupeds, and fowls, their cornea is more soft and delicate.

The cornea is composed of several parallel laminæ, which are nourished by many blood-vessels, so fine, as not to hinder even the smallest rays of light from entering the eye. It has a most exquisite sense, to the end that, upon the least pain, the tears may be squeezed out of the lachrymal gland, to wash off any filth, which, by sticking to the cornea, might render it cloudy, or dim.

Mr. Winslow, having observed that the cornea, after death, is commonly covered with a kind of membrane or glairy coat, which sometimes tarnishes the eye to such a degree, that the pupil can scarcely be distinguished; and further observing, that this membrane is to be found as well in those who die with their eyes open, as shut, was hence led to suspect, that it was formed of a lymph which naturally concreted through those pores of the cornea, mentioned by Steno in his "Treatise on the Glands and Muscles;" and, after many fruitless attempts to discover these pores, he at last fortunately succeeded: for by pressing the eye in a certain manner, which occurred to him by accident, he could distinctly see this liquor sweating through these pores, and form small drops upon the cornea, which gradually diffused themselves over its whole surface. (See Mem. de l'Acad. Ann. 1721.)

This glairy coat is very tender and delicate, so that it breaks into many pieces when it is touched, and is easily removed altogether by wiping the cornea. It commonly begins to be formed a little while before death; and hence the eyes lose their brilliancy, and becoming dull and lifeless assume a certain appearance, which has been looked upon as a certain sign of a speedy dissolution. It is not therefore without some reason, says Dr. Porterfield, (Treatise on the Eye, vol. i. p. 146.) notwithstanding what Plempius says to the contrary, that Pliny (l. xxviii. c. 6.) tells us, that while the pupil reflects images, death is not to be feared. See EYE and VISION.

It is sometimes necessary to make incisions through this tunic, in order to discharge not only matter, but even blood, when extravasated by external injuries, if it will not give way to the common methods of dispersion, to prevent the stagnant blood from suppurating and destroying the eye. There have been instances when this has been done

with great success, and without any deforming cicatrix, the sight having been also perfectly restored by it. See ACHLYS.

CORNEA-Knife, in *Surgery*, an instrument used for making an incision into the cornea, previous to the extraction of a cataract. (See CATARACT.) It should be of such a width as to equal the dimension of a semi-diameter of the cornea, which is to be cut through by one incision, and not by a see-saw division. The back of the cornea-knife, Mr. Ware observes, should never be so thin as to cut above the eighth part of an inch beyond its point; by which precaution, enough will be left of its back, in a blunt state, to secure the iris against injury.

CORNEGLIANO, in *Geography*, a town of Italy, in the Parmesan; 12 miles S.W. of Parma.

CORNEILLAN, a town of France, in the department of the Landes; 5 miles S. of Aire.

CORNEILLE, *PERRER*, in *Biography*, a celebrated French dramatist, was born at Rouen, the 6th of June, 1606. He was brought up to the bar, but advocated only one cause, and accepted of the place of advocate general at the marble table of the parliament of Rouen, which was a kind of sinecure. A trifling affair of gallantry induced him to write his first comedy, entitled "Mélite;" the success of which brought him to Paris, and encouraged him to five or six attempts of the same kind. After these he ventured upon "Medea," a tragedy imitated in part from Seneca; and at the age of 31, he produced the famous tragedy of the "Cid," the principal beauties of which were, however, borrowed from the Spanish theatre. Still it raised his reputation to the highest pitch; and the enthusiastic applause with which it was received was such, that "Cela est beau comme le Cid" became the fashionable expression of the age. Even the great cardinal de Richelieu grew jealous of Corneille's celebrity; and though he pensioned the poet, secretly joined in a confederacy against his poems. His animosity induced Corneille to write the following verses, after the cardinal's death:

"Qu'on parle bien ou mal du fameux cardinal,
Ma prose, ni mes vers n'en diront jamais rien;
Il m'a fait trop de bien pour en dire du mal,
Il m'a fait trop de mal pour en dire du bien."

To support the fame which he had so justly earned by his "Cid," Corneille produced successively the beautiful tragedies of the "Horatii," "Cinna," "Polyeucte," "Pompée," and "Rodogune." In 1647, he was chosen a member of the French academy. After Cinna and Rodogune, his poetical fire appeared to abate: he wrote five more tragedies, which were not so well received. The bad success of his "Pertharites," in particular, made him relinquish the dramatic career for some time, which he devoted to an excellent translation of "Kempis's Imitation of Jesus Christ." His genius, however, resumed its former bent. He produced four tragedies more, and died eight or ten years after having written "Sirena," on the 11th of October, 1684, in the 79th year of his age. His works have been frequently reprinted: they consist of nine comedies, two-and-twenty tragedies, and some smaller poems. The best edition is that in 8vo., with Voltaire's notes. Corneille left no fortune to his descendants. One of his great nieces was educated and provided for by Voltaire; and another of his distant relations, a young boy, is now receiving his education at the expense of the French government.

According to Racine, it is not easy to find a poet who united so many great talents. Corneille possessed at once skill, strength, judgment, and genius. The grandeur of the subjects

jects of his tragedies, and the manner in which he has treated them, are equally striking. We know not which to admire most, the vehemence of his passions, the majesty of his sentiments, or the dignity and prodigious variety of his characters. Corneille, says Dr. Blair, (*Lectures*, vol. iii. p. 344) who is properly the father of French tragedy, is distinguished by the majesty and grandeur of his sentiments, and the fruitfulness of his imagination. His genius was unquestionably very rich, but seemed more turned towards the epic than the tragic vein: for, in general, he is magnificent and splendid, rather than tender and touching. He is the most declamatory of all the French tragedians. He united the copiousness of Dryden with the fire of Lucan; and he resembles them also in their faults, in their extravagant impetuosity. The character of Corneille is happily contrasted with that of Racine, in the following beautiful lines of Marry, a French poet:

“ *Illum nobilibus majestas evehit alis
Vertice tangentem nubes: stant ordine longo
Magnanimi circum heroës, fulgentibus omnes
Induti trabeis; Polyæctus, Cinna, Seleucus,
Et Cidus, et rugis signatus Horatius ora.*”

CORNEILLE, THOMAS, a French dramatist, brother to the celebrated Peter Corneille, was born at Rouen in 1615. He wrote several dramatic pieces, one of which, “*Don Juan*,” or “*Le Festin de Pierre*,” has kept the stage. His success, and indeed his merit as a poet, were greatly inferior to those of his brother; yet, in compliment to the celebrity of the deceased, he was chosen to succeed the great Corneille as a member of the French academy, where he took his seat on the 2d of January, 1685. He died in 1709, and left, besides his dramatic works, a “*Translation of Ovid’s Metamorphoses*,” “*Remarks upon Vaugelas*,” “*a Dictionary of Arts*,” and “*an Universal Geographical and Historical Dictionary*,” chiefly esteemed for an accurate account of Normandy, which was his native province.

CORNEILLE, MICHEL, a painter and engraver, was born at Orleans in 1603. He became the disciple of Simon Vouet, whose manner he assiduously imitated, until his death, which took place in 1664. He painted many considerable works in the palaces and churches of France, and etched a few plates from Raffaele, the Caracci, &c. Huber.

CORNEILLE, MICHEL, the son of the preceding artist, was born at Paris, 1642. After having acquired the first principles of painting, under the direction of his father, he travelled to Italy, and is said to have completed his studies in the school of the Caracci, whose style of drawing, particularly in landscape, he imitated with enviable success. He painted several considerable works in the churches of Paris, and at the palaces of Fontainebleau and Versailles; and etched many excellent plates, as well from his own compositions, as from those of Raffaele and the Caracci. He died a member of the academy at Paris, in the year 1708. Huber.

CORNEILLE, JEAN BAPTISTE, the younger brother of the preceding artist, was born at Paris in 1646, and, like him, after having acquired the rudiments of his art under his father, completed his studies in Italy. Upon his return to Paris, he was made professor of the academy of painting, and soon became an artist of some eminence. One of his principal pictures is *St. Peter delivered out of Prison*, in the church of Notre Dame. After the example of his brother, he etched many plates from his own compositions, and from those of the Caracci, besides part of a work representing the

finest statues of Rome and Florence, measured and drawn from the originals. He died in 1695. Huber.

CORNILLE, in *Ornithology*, the name given by Buffon to the *Carrion Crow* of Pennant, Latham, &c.; or CORVUS *Corone* of Gmelin.

CORNEILLE, *La*, in *Geography*, a town of France, in the department of Calvados; 4 leagues S.W. of Falaise.

CORNEL, in *Botany*. See CORNUS.

CORNELIA, Ard. See AMMANIA *baccifera*.

CORNELIA *Castra*, in *Ancient Geography*, a place of Africa, near the mouth of the Bagradas. This is the place where Scipio pitched his first camp after his arrival in Africa, at the close of the second Punic war.

CORNELIA, in *Biography*, daughter of Scipio Africanus, a celebrated Roman, and wife of Tiberius Sempronius Gracchus, who held the consulship in the year 177 B.C. By him Cornelia had twelve children, and was left, while young, a widow. To the education of her offspring she devoted her whole time and undivided attention, though only three arrived to a state of maturity, *viz.* Tiberius and Caius Gracchus, and a daughter, married to Scipio the Younger. These were highly indebted to their mother for that distinction and rank which they afterwards held in the commonwealth; and for them she ever felt the utmost regard. When a lady had exhibited her jewels at Cornelia’s house, and begged to be indulged with the sight of her own, the affectionate parent produced her two sons, saying, “*These are the only jewels that I have to shew.*” Too ambitious of being distinguished, she probably urged them in that career which terminated in their destruction. She is said to have reproached them in their youth, that they had not rendered her illustrious as the mother of the Gracchi: and after their untimely death, she replied to one who would have condoled with her on their account, that “*the woman who had given birth to the Gracchi could not be deemed unfortunate.*” In retirement she cultivated literature, and paid great attention to men of learning and worth: with these she would converse of her sons with tranquillity and apparent unconcern, as if she were contemplating some great characters of remote antiquity. After her decease, the Romans erected a statue to her memory, with this inscription, “*To Cornelia, mother of the Gracchi.*” Plutarch. *Univer. Hist.*

CORNELIAN. See CHALCEDONY.

To give these stones the greater lustre, in setting them they usually lay a piece of silver-leaf underneath.

The principal use made of cornelians is in seals; by reason they grave well, and take a fine polish.

Mr. du Fay, of the academy of Sciences at Paris, accidentally hit upon a very fine way of turning any part of a red cornelian white, so as to form veins or clouds of that colour at pleasure in it, by filling up the lines with white enamel in powder, then putting it over the fire to melt the enamel. *Mem. Acad. Par.* 1732.

CORNELIAN *Cherry*, in *Botany*. See CORNUS *mascula*.

CORNELII, in *Ancient Geography*, a place of Italy, on the Flaminian way; 26 miles from Arretium, according to the Itinerary of Antonine.

CORNELIUS, or CORNELY, CORNELIUS, in *Biography*, called likewise *Cornelius Van Haerlem*, from the place of his nativity, was born in 1562, and studied painting under Peter le Long the Younger, whom he soon surpassed. He afterwards received instructions from Francis Pourbus and Gilles Coignet, and at length established the reputation of being one of the best historical painters of his school at that period. Unfortunately, however, he was prevented fulfilling his intention of completing his studies in Italy; and we have,

therefore, frequently to regret that the beautiful carnations, which characterise the works of this master, should be accompanied by a style of drawing so incorrect and extravagant: a fault, however, rather of the school than of the man. Cornelio painted with equal facility both in small and large; and several of his compositions, evincing extraordinary invention, have been finely engraved by Joan Muller, J. Saenredam, and J. Matham, and are enumerated by Heineken. He died in 1638. Descamps.

CORNELISZ, or CORNELISSEN, JACOB, a painter and citizen of Amsterdam, where, according to Van Mander, he enjoyed great reputation, about the year 1512. He painted several altar pictures for the principal churches of Amsterdam, Alkmeer, and Haerlem, and died at the former city, at an advanced age. The author above-mentioned informs us, that many of his works were engraved in wood. These are considered by Heineken to be the same prints generally attributed to John Walther Van Apen, and which consist principally of twelve circular plates, representing the Passion of Christ, surrounded by ornamental borders, dated 1513, 1514; a suite of subjects from the Bible, on a smaller scale, with ornamental borders, &c. published 1523; and some most spirited friezes and processions. Descamps. Heineken.

CORNELIUS, POPE, native of Rome, and elected to his high office in the year 251, on account of his many virtues and peaceable temper; though he was opposed by Novatian, a man greatly celebrated for his learning and eloquence. This circumstance gave rise to the sect of Novatians in the churches, which, with their peculiar tenets, will be described under the article NOVATIANS. Cornelius, in this affair, seems to have lost his moderation and pacific temper, and to have resorted to the harsh acts of anathematizing and excommunicating his opponent, which proved of no avail to his cause. Under the emperor Gallus, Cornelius was banished; and in a very short time died a natural death, having lived but fifteen months after his elevation to the papal see. Moreri.

CORNENSII, a people placed by Ptolemy towards the middle of the island of Sardinia, otherwise called *Æchilenii*.

CORNER-STONES, among *Builders*, the name of the two stones which stand one in each jamb of a chimney. Their faces are hollowed in breadth, being a certain sweep of a circle. The breadth of each stone is equal to that of the jamb, and their height reaches from the hearth to the mantle-tree.

Corner-stones are commonly made of Rye-gate, or fire-stone.

CORNER-teeth, are those which appear in a horse when he is coming five years old. See AGE.

CORNES DE BELIER, ram's-horns, in *Fortification*, low flanks to supply the place of tenailles, for the defence of the ditch. See the articles CONSTRUCTION, *military*, and *ouvrage a corne*, or HORNWORK.

CORNET, in *Ferriery*, an instrument used in bleeding horses.

CORNET, or CORONET, is sometimes used to denote the lowest part of the pattern of a horse round the coffin.

CORNET, in the *Military History of the Ancients*, a horn, or musical instrument, much in the form of a trumpet. Vegetius informs us, that the legions had trumpets, cornets, and buccinæ; that when the cornet only sounded, the ensigns, or standard-bearers, were to move forward without the soldiers; but, when the trumpets only sounded, the soldiers were to advance, or move forward, without the ensigns or standard-bearers; that the cornets and buccinæ sounded the charge and retreat, and the cornets and trum-

pets during the battle. A troop of horse was also so called.

CORNET, in the *Military History of the Moderns*, is the third commissioned officer in a troop of horse or dragoons, subordinate to the captain and lieutenant, and equivalent to an ensign of infantry. His duty is to carry the standard near the centre of the front rank of the troop or squadron. He takes his title from his ensign, which is square, and is supposed to be called by that name, from *cornu*; because placed on the wings, which form a kind of points, or horns, of the army; others derive the name from *coronet*; alleging, that it was the ancient custom for these officers to wear coronets, or garlands, on their heads.

CORNET *d'ouie*, a hearing trumpet, a trumpet of beaten iron, which those who go the rounds make use of for hearing over the parapet, what passes in the ditches, and even beyond the covert-way. It can also be used at night for the better hearing of, and receiving the watch-word.

CORNET, a coarse musical instrument, called in France *le bouquin*, or goat's horn, used by the cow-keepers to call the cattle together at milking and foddering time. An instrument called a *cornet*, was formerly used in the orchestra in Italy, under the name of *cornetto*, and *cornettino*, and the performers on it are frequently mentioned with *elogie* during the 16th and 17th centuries. Artusi, an intelligent writer on music, in his treatise, "Delle Imperfettione della Moderna Musica," gives a curious account of the state of instrumental music in his time; and in describing a grand concert that was made by the nuns of a convent at Ferrara in 1598, on occasion of a double wedding between Philip the III. king of Spain, with Margaret of Austria, and the archduke Albert, with the infanta Isabella, the king's sister, he enumerates the several instruments that were employed, and points out their excellencies and defects. Among these, though the violin is just mentioned, yet nothing is said of its properties, while the cornet, trumpet, viol, double-harp, lute, flute, and harpsichord, are honoured with particular remarks, both on their construction and use; but among these, the cornet, which has been supplanted in the favour of the public by the hautbois, seems to have stood the highest in the author's estimation. The elder Doni, in his dialogue written about fifty years before, mentions the cornet more frequently than any other instrument: "Il divino Antonio da *cornetto*, perfettissimo—& M. Battista dal Fondaro con il suo *cornetto* ancora; che lo suona miracolosamente."

There is a brilliant solo stop in the organ, called a *cornet*, consisting of five ranks of pipes; it is usually a half stop, going down no lower than the middle C; or, at most, to F on the 4th line in the base. It is composed of a diapason, principa', 12th, 15th, and tierce or major 17th; so that every note is a complete chord, such as nature gives in the harmonies to every sound; but of which we can only distinguish such as are produced by the lower part of the scale.

Jack James, Magnus, and Stanley, three celebrated organists, in the early part of the last century, used to play rapid movements on the cornet, as a solo stop in their voluntaries, accompanied by the two diapasons; and, as it has no base, it should not be drawn out in the chorus, or full organ, unless the sesquialtra is divided into two half stops, and the lowest half only is drawn out as a base to the cornet.

CORNET *stop*, on an organ, is a compound treble stop, in the use of which each finger-key acts upon and occasions five pipes to sound at the same time, *viz.* one in unison, with the note proper to that finger-key, (and also with the same note in the stop, called diapason,) another which is tuned a true major third above it, another a *ffib*, another an *eighth*, and the uppermost a true major *seventeenth* above the note.

Dr. Smith remarks, (Harmonics, p. 10.) that the best tuning of an organ cannot wholly prevent that disagreeable battering of the ears with a constant rattling noise of beats, quite different from all musical sounds, and destructive of them, and chiefly caused by the compound stops called the cornet and sequialter, and by all other loud stops of a high pitch, when mixed with the rest. The cornet stop is generally used in our churches, with the diapason, in the interludes, and giving-out of the psalms.

CORNETO, in *Geography*, a town of Italy, in the state of the church, and province of Patrimonio, the see of a bishop, immediately held from the pope, and united with the see of monte Fiascione; 38 miles N. W. of Rome.

CORNETTA, a town of Persia, in the province of Irak; 80 miles E. of Ispahan.

CORNETTE BLANCHE, an ornament among the French in former times, which served to distinguish their officers, who were high in command. It was worn by them on the top of their helmets. Under Charles IX., Henry III., and Henry IV., this appellation was also given to the royal standard, and under Charles VIII. to the *cornette royale*. It was substituted in the room of the *etendard ou pennon royale*. But neither were unfurled except when their kings went in person to command their armies. The persons who served under it, were princes, noblemen, marshals of France, and old captains, who received their orders directly from the king.

CORNETTE (*porte*) *blanche*. This was under the later kings of France, an office in the king's household, dependent on the great steward, who received the provisions of purveyance. The *porte-cornette blanche*, of the light cavalry, however, did not depend on the grand steward, but on the colonel-general of light cavalry.

As to the *port-etendard royale*, or the bearer of the royal standard, it was incumbent on him to remain dead or alive on the field of battle. If he were made prisoner, the king paid his ransom. Every night, this standard was placed by the bed-side of the king. This standard, or the *cornette blanche royale*, was simple, and without any mixture of colours, or of the *fleurs-de-lys*.

The *cornettes* or *cornets* of the colonel-general of cavalry, in the old French service, as well as those attached to the quarter-master-general and commissary-general, ranked as lieutenants, and the *cornettes of la colonelle generale des dragons*, ranked as youngest lieutenants, and commanded all other cornets.

CORNETTE was also a term used by the French to denote the standard peculiarly appropriated to the light cavalry, from which circumstance *cornettes* and troops were synonymous terms for expressing the number of light horse attached to an army. The standard, so called, was made of taffeta or glazed silk, about one foot and a half square, upon which the arms, motto, and cypher of the prince who commanded the cavalry, were engraved. A sort of scarf, or long piece of white silk, which forms the French colours, was tied to the cornette, whenever the cavalry went into action, in order to render the standard conspicuous for the men to rally round it.

CORNETTO, ADRIAN, in *Biography*, a cardinal, and furnished Catechesi, from the place of his birth, was sent by pope Innocent VII. in the quality of a nuncio to England, where he was made bishop. first of Hereford, afterwards of Bath and Wells, by Henry VII. He was likewise nuncio at the court of France, and on his return to Rome, was made secretary to Alexander VI., who presented him with a cardinal's hat. He had not long enjoyed that

dignity before an attempt was made to poison him by Cæsar Borgia, natural son of Alexander. The pope himself fell the victim, by drinking the liquor that had been prepared for the cardinal. On the accession of Julius II. he fled for security to the mountains of Trent, but was recalled by Leo X. During this reign, he engaged in intrigues which obliged him to quit Rome, after which we have no certain account of what became of him. He was author of many works; one entitled, "De Vera Philosophia;" another "De Poetis;" a third, a poem "On the Chace." He was likewise a reformer of the barbarous Latin style, and formed his taste on the model of Cicero, and the authors of the Augustan period, with whose writings he was conversant. Moreri.

CORNI, in *Ancient Geography*, a people of Italy, in Latium.—Also, a town of Sardinia, placed in the Itinerary, 18 miles from Bosa.

CORNIASPA, a town of Asia, in Galatia, placed by Antoninus on the route from Tavia to Sebaste.

CORNIBAT, in *Geography*, a large town of Turkey in Europe, in Romelia, famous for dyeing and preparing the fine purple and yellow leather of this country, which it vends in great quantities.

CORNICE, in *Architecture*. A word derived from the Latin *coronis*, a crowning, and used generally to denote any moulded projection which crowns or finishes the part to which it is affixed; thus we have the cornice of an order, of a pier, of a pedestal, of a house, door, or window, &c.

Every regular entablature consists of three principal parts, the architrave, frieze, and cornice, which are placed in the order here mentioned, the cornice occupying the highest situation; (see *Plates* XVI., XXVIII., XIII., XIV., XXIX., of *Architecture*.) For the various forms of cornice depending upon the order of architecture to which they are applied, the reader is referred to the articles DORIC, IONIC, CORINTHIAN, TUSCAN, and COMPOSITE Order; it remains in this place to deliver some general observations respecting the origin and application of cornices.

The cornice is an original member belonging to construction, representing the timbers of a roof projecting over, and forming a shelter to the inferior parts. The Doric, as the primitive order of Grecian architecture, bears the most clear and authentic marks of its origin, in the imitation of the forms and proceeding of wooden construction, and in this composition the cornice is marked by mutules, which represent the ends of the rafters. In this instance, the imitation is so undisguised, that the fossite of the corona and the mutules have the same inclination as the roof, of which they form a part. The dentils of the Ionic order are also supposed to represent the smaller covering rafters or laths which immediately supported the tiles; and on this account Vitruvius, true to the theory of his art, condemns the introduction in the same cornice of dentils, below the mutules or modillions, and observes, very justly, that they were never so placed in Grecian buildings. The Romans, however, were not so scrupulous, and their best works of the Corinthian order present numerous examples of the practice reproved by Vitruvius.

The origin of cornices will point out their proper application; as they represent a roof, they ought never to be placed where some kind of a roof cannot be supposed to exist. In the hypæthral temple at Paestum, a work of a most primitive character, the cella is divided by two lateral galleries of columns, two tiers in height, and the upper columns are placed immediately upon the architrave of the lower, the frieze and cornice being omitted. This example

shows the adherence of the early Greeks to the system upon which their style was founded; they felt the propriety of omitting the representation of those parts whose type could not really exist. But the Romans, in this particular, departed from the Grecian practice, and in all their buildings containing several stories of columns, as the theatre of Marcellus, the Coliseum, the amphitheatre of Verona, we find complete orders, with entablatures, consisting of architrave, frieze, and cornice.

Modern architects have hitherto followed Roman examples; and, perhaps, in an art so much depending upon imitation and precedent, their authority may be deemed sufficient; but it must be recollected, that the Romans were themselves borrowers; and the real connoisseur and lover of his art will choose to drink as near the source as possible, and often, to supply the deficiencies of examples, with the study of that type and system, which are above authorities.

CORNICE, *Architraved*: an entablature, consisting of an architrave and cornice, the frieze being retrenched. Architraved cornices are frequently used in situations where, for any reason, a complete entablature would be inconvenient. There is an antique example in the Cariatid portico at Athens. See *Plate XIX. of Architecture.*

CORNICE Block. A cornice supported by square plain blocks; thus the Tuscan is a block cornice, of which there cannot be a better example than the church of St. Paul, Covent Garden. See *Plate XIV. of Architecture.*

CORNICE Mould. The cornice proper to the Doric order.

CORNICE Dentil. A cornice with dentils, proper to the Ionic order.

CORNICE Modillion. A cornice containing modillions. This cornice is particularly applicable to the Corinthian order.

CORNICE Cantalever. A cornice with cantalevers. In establishing a distinction between this term and the last, we should say that a cantalever is a word not belonging to regular architecture, but is used to denote almost any kind of block or bracket, except those appropriated to the cornices of the orders, which must, however, be of a curved form, approaching to a Corinthian modillion; thus, cantalever cornices are generally found in buildings where columns are not used, and have frequently a greater projection than regular cornices.

The entablature of the second order of St. Paul's Cathedral, has great cantalevers, descending quite to the bottom of the frieze; and Bernini appears to have been fond of this kind of cornice, having introduced it in the Barberini palace, and in his design for the Louvre, but these examples are not common, and must be regarded as abuses and violations of the rules of regular architecture.

CORNICE Coving. A cornice which has a great cavetto, or cove in it, ordinarily lath and plastered upon brackets. Cornices of this kind are frequently found in old houses, but are only used economically, to save the cantalevers which would otherwise be necessary to support the projection of the eaves.

CORNICE Mutilated. A cornice, of which some members are interrupted or intersected by some other object, as a window, tablet, &c.

CORNICEN, Lat. a horn blower. Before the Romans were acquainted with the use of the trumpet, a cornicen brought sounds from the horn of a wild ox that was mounted with silver. The sound was very strong and shrill, and conveyed an order to a great distance.

This instrument, which in the eyes of many does not appear to be an invention of much consequence, was not a contrivance of the Romans themselves, who borrowed it from

the Phrygians, among whom one named Marfyas is said to have been the inventor.

CORNICHE, *glacis of the*. See **GLACIS**.

CORNICHE-ring, in *Gunnery*, the next ring from the muzzle of a gun backwards.

CORNICLI, or **CORNICULI**, in *Ancient Geography*, mountains of Italy near Rome.

CORNICLO, or **CORNICULANENSIS**, an episcopal town of Africa, in Mauritania Cæsariensis.

CORNICULA, an instrument made of horn, almost in form of a cupping-glass, except that at the more slender extremity there is a small perforation. The wide end is laid upon emaciated parts, and a person applying his mouth to the perforation at the small extremity, by suction draws out the air. In consequence of this the part covered rises into the hollow of the instrument; and by this means the nutritious juices are thought to be invited to the emaciated part. Hildanus, cent. 1. obs. 80, relates a cure performed by this means, and gives a figure of the instrument. Tulpius, lib. iii. obs. 49, gives another instance of a cure performed by this means.

This instrument was by the ancients esteemed a species of cupping-glass.

CORNICULANI, in *Ancient Geography*, a place of Italy, between Fossa Clodia, Ravenna, and Petavium, according to the table of Peutinger.

CORNICULARIA, in *Botany*, a genus formed by Achard for some of the lichens of Linnæus, with the following character. *Shields* terminal, at first flat and sometimes radiate, afterwards convex, twisted, unequal, with inflexed borders. *Stems* solid, stiff, smooth, branched like a shrub and stretched out on the ground. It contains *L. tristis*, *lanatus*, *pubescens*, &c. See **LICHEN**.

CORNICULARIS processus, the process, or knob, of the shoulder-bone; thus called, as resembling the figure of a crow's beak.

CORNICULARIUS, in *Antiquity*, an officer in the Roman army, whose business was to aid and assist the military tribune in quality of lieutenant.

The *cornicularii* went the rounds in lieu of the tribune, visited the watch, and were nearly what the aids-major are in the French army.

The denomination *cornicularius* was given them from a little horn, called *corniculum*, which they used in giving orders to the soldiers: though Salmasius derives it from *corniculum*, the crest of a head-piece; it being an observation of Piny, that they wore iron or brass horns on their helmets; and that these were called *cornicula*. In the *Notitia Imperii* we find a kind of secretary, or register, of the same name. His business was to attend the judge, and enter down his sentences and decisions.

The critics derive the word, in this sense, from *corniculum*, a little horn to put ink in.

CORNICULATE FLOWERS, in *Botany*. See **FLOWERS**.

CORNICULATE plants are such as, after they have blown into flower, produce many distinct and horned pods, or seed-vessels, called *siliquæ*; for which reason the plants are also, by some, denominated *siliquous plants*.

Such are, the sedum, or sempervivum, telephium, juncus floridus, helleborus niger, pæonia, caltha palustris, althæa lutea, &c.

CORNICULUM, Lat. a little horn. This appellation was also given to a species of horn of iron or brass added to the helmet as a military ornament, which was given to Roman soldiers, who had given striking proofs of their bravery or courage.

CORNICULUM, in *Ancient Geography*; a town of Italy, in Latium, which did not subsist in the time of Pliny.

CORNIDIA, in *Botany*. Flor. Peruv. tab. 35. Class and order. *obcordata monogynia*.

Gen. Ch. *Cal.* campanulate, obtusely trigonous, permanent. *Cor.* Petals four, concave, sessile, caducous, fixed to the edge of the calyx. *Stam.* eight, fixed to the edge of the calyx. *Pist.* Germ. superior, divided into three parts; styles three, permanent; stigmas simple. *Peric.* Capsule tricoccos, three-horned, three-celled, three-valved. *Seeds* numerous, wedge-shaped. The only species known is a tree, native of Peru.

CORNIGLANO, in *Geography*, a town of Italy, in the principality of Piedmont; 5 miles W.N.W. of Alba.

CORNIGLIANO, a town of Italy, in the Milanese; 15 miles E. of Milan.

CORNILLIA, a town of Genoa; $4\frac{1}{2}$ miles S.W. of Spezza.

CORNILLON, a town of France, in the department of the Gard, and district of Uzès; 7 miles S.W. of Pont St. Esprit.

CORNIMONT, a small town of France, in the department of the Vosges, in the district of Remiremont. It has 1701 inhabitants, and is the chief place of a canton which contains ten communes and a population of 12,078 individuals upon an extent of 215 kilometres.

CORNISH, in *Geography*, a township of America, in Cheshire county, New Hampshire, on the E. bank of Connecticut river, between Claremont and Plainfield, about 15 miles N. of Charlestown, and 16 S. of Dartmouth college. It was incorporated in 1763, and in 1790 contained 982 inhabitants.

CORNISH. See **CORNICE**.

CORNISH chough, in *Zoology*. See **CORACIAS**.

CORNISH diamond, a name given by many people to the crystals found in digging the mines of tin in Cornwall. These crystals are of the nature of the Kerry stone of Ireland, but somewhat inferior to it: they are usually bright and clear, except toward the root, where they are coarse and foul, or whitish. They are usually found in the common form of an hexangular column, terminated at each end by an hexangular pyramid.

CORNISH, in *Philology*, a dialect of the ancient British language. The Britons, on the arrival of the Saxons, being driven into countries remote from each other, their language would, in process of time, become differently written and pronounced, and mixed in different degrees with other languages, so as to constitute the Armorican, Welsh, and Cornish, which seem to have never been radically distinct, for those who are versed in any one of these can interpret the others with tolerable facility. (See Gough's Camden, vol. i. p. 11.) The Cornish Britons, from the fourth or fifth century downwards, maintained an intimate correspondence with the natives of ARMORICA, whither a colony of Welsh had migrated during the destruction of the empire; intermarrying with them, and perpetually resorting thither for the education of their children, for advice, for procuring troops against the Saxons, for the purposes of traffic and various other occasions. This connection was so strongly kept up, that an ingenious French antiquary (M. l'Abbé Lebeuf) supposes that the communication of the Armoricans with the Cornish had chiefly contributed to give a roughness or rather hardness to the Romance or French language in some of the provinces, towards the 11th century, which was not before discernible. This intercourse will appear more natural, if we consider, that not only Armorica, a maritime province of Gaul, never much frequented by the Romans, and at the

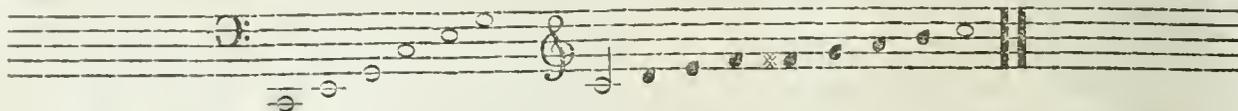
time to which we now refer totally deserted by them, was still in some measure a Celtic nation; but that also the inhabitants of Corawall, together with those of Devonshire, and of the adjoining parts of Somersetshire, intermixing in a very slight degree with the Romans, and having suffered fewer important alterations in their original constitution and customs from the imperial laws and police than any other province of this island, long preserved their genuine manners and British character; and forming a sort of separate principality under the government of a succession of powerful chieftains, usually denominated princes or dukes of Cornwall, remained partly in a state of independence during the Saxon heptarchy, and were not entirely reduced till the Norman conquest. A strict intercourse was upheld between Cornwall and Wales, as well as between the former and Armorica. Their languages, customs, and alliances, were the same; and they were separated only by a narrow strait of inconsiderable breadth. Cornwall is frequently styled West Wales by the British writers. At the invasion of the Saxons, both countries became indiscriminately the receptacle of the fugitive Britons. We find the Welsh and Cornish, as one people, often uniting themselves as in a national cause against the Saxons. They were frequently subject to the same prince, who was sometimes chosen from Wales and Cornwall, but sometimes from Armorica, and also sometimes resided in Wales, and sometimes in Cornwall; and the kings or dukes of Cornwall were perpetually sung by the Welsh bards. Traditions about king Arthur, to mention no other instances, are as popular in Cornwall as in Wales; and most of the romantic castles, rocks, rivers, and caves, of both nations are alike at this day distinguished by some noble achievement, at least by the name, of that celebrated champion. Hence we can be at no loss to assign a reason, why Cornwall, in some of the French romances, is made the scene and the subject of so many romantic adventures. Hence also Cornwall, in particular, retained its old Celtic dialect till the reign of queen Elizabeth. No traces, however, of the old Cornish language now remain; and it must have been nearly, if not wholly, extinct, for a long time; as Mr. Ray could not meet with more than one person who wrote it as long ago as the year 1662. Indeed, Mr. Barrington was fortunate enough to find an old woman, who spoke it very fluently, when he visited this county in 1768; and this woman was living at the age of 90 years in 1776. (Archæol. vol. iii. v.) But the language was not wholly lost with her, for Mr. Barrington (*ubi supra*) and Dr. Pryce in his "Archæologia Cornu-Britannica" published in 1790, inform us, that at Moushole near Penzance there was a fisherman in 1776, 65 years of age, who had written a letter both in English and Cornish, and who spoke the language very readily. In this village there were also four or five other persons, capable of conversing in Cornish. This fisherman informed Dr. Pryce, that being at Morlaix, on board a smuggling cutter, he was much surprised to find, that he understood, without knowing a word of French, part of the conversation of some boys at play in the streets; and on further inquiry, he found that he could make known all his wants in Cornish, and be better understood than he could be at home, when he used that dialect. Many causes have contributed to occasion the extinction of the Cornish language. In this language there are extant no more than three or four books; one of them is a MS. found in the Cotton library, about 800 years old, from which time no other MS. appears, till about the 15th century, when one occurs exhibiting three interludes taken from Holy Writ, the originals of which, with two or three more, are in the Bodleian library. Besides, the cessation of the intercourse and correspondence with the people of Bretagne under Henry VII.,

and the jealousies that have existed between the natives of this country and Wales, since the latter has become a mining country, have been the means of confining the Cornishmen to a communication in their original language only with each other. Whereas the Welsh, having had much less intercourse with their neighbours than the people of Cornwall, we cannot be surprised that the language of the former has survived that of the latter. The Cornish have contended, that in sweetness of sound they excel the Welsh, as in the word "Stone," which they call "Lêh" and the Welsh "Lech;" but the Welsh do not submit to this award; alleging that notwithstanding the multiplicity of gutturals and consonants with which their language abounds, it has the softness and harmony of the Italian, with the majesty and expression of the Greek.

CORNITO, in *Geography*, a town of Naples, in the province of Principato Citra; 7 miles S.S.W. of Cangiano.

CORNIX, in *Ornithology*, *Cornicille mantalee* of Buffon, the *Roysson crow* of Albinus and Willughby, the *hooded crow* of Pennant and Latham, and the *CORVUS Cornix* of Linnæus and Gmelin. This is also a name given by Gesner, Aldrovand, Ray, and Brisson, to the *CORVUS Corone*. The *Cornix Cærulea* of Gesner is the *ROLLER* of Pennant, &c. and the *CORACIAS garrula* of the Linnæan system. The *Cornix atra*, with yellow head, neck, and breast, is the *Carouge de Cayenne* of Buffon, the *yellow-headed starling* of Edwards, the *yellow-headed oriole* of Latham, and the *ORIOULUS interocephalus* of Gmelin.

CORNO DA CACCIA, *Ital.* See *French Horn*, and *Russian Music*.



When any other key than C is required, it is expressed at the beginning of the piece, by informing the player, that it is a D, an E \flat , an E \natural , F or G horn, that is wanted.

CORNOGAL, in *Geography*, a town of the island of Ceylon; 30 miles N.N.W. of Candy.

CORNOUAILLES, a country of France, so called before the revolution, in Bretagne.

CORNU, in *Ancient Geography*, a place, according to Philostratus, in the isle of Lemnos. Mela and Pliny call also by this name two promontories of Italy, one in the country of the Brutii, the other in that of the Salentini.

CORNU Ammonis, in *Natural History*, an extraordinary kind of stone, some of which in vinegar, juice of lemons, &c. have a motion like that of an animal.

It is rough, knotty, of an ash-colour, and twisted in manner of a ram's horn; such as those wherewith the ancients represented Jupiter Ammon; whence its name.

It is disputed, among naturalists, whether it be a native fossil, a *nautilus*, or a rock-plant? Camerarius maintains the first; urging that it is frequently dug out of the tops of mountains; and that it is seldom found near the sea-shore.

Dr. Woodward asserts it a shell, and of the number of the *nautilus*, formed in the sea, and carried thence, by the waters of the deluge, into the countries whence it is dug. He argues, that, if it be rarely found on the sea-coasts, it is because shells and other bodies lying in the bottom of the sea, as most kinds of the *cornua Ammonis* must do, are only to be torn thence, and driven ashore by tempests: but the most violent tempests never move the bottom of

There are various pneumatic instruments of music, in the form of [the horns of animals; and perhaps, in high antiquity, the horns themselves were used instrumentally. In the sacred writings we are told, that the trumpets of rams' horns were used at the siege of Jericho; which, however, seem to have been less musical instruments, than military signals for the assailants to march and shout by, in order, by their noise, to terrify and dismay the enemy.

At present, the *French horn*, which the French themselves style *cor de chasse*, and the Italians *cornu da caccia*, or hunting horn, is at the head of the *horn* family. It is an admirable instrument in the field or theatre; and when the composer is careful not to dwell on the 4th or 6th of the key, which are naturally false, and the performer has a nice ear, never overblowing or forcing the tone, its effects, in full pieces, are magnificent and grateful. Its defects of intonation are the same as in the trumpet. By means of the hand inserted in the tube, the chromatic scale is obtained in one octave; the only regular series of sounds with which either the horn or trumpet is furnished. There have been, and there are now, players on the instrument, who can produce all the half-notes, and perform in all keys, major and minor: but the artificial notes, like those of the voice in falset, are inferior to the natural, less sonorous, and seem to be produced with difficulty.

The French horn parts in symphonies, concertos, and songs, are generally written in the key of C, for all other keys; as, by means of crooks, every major key can be acquired. The French horn is naturally an octave below the trumpet, its scale being the following:

the sea, as the divers have put past doubt; so that it is no wonder if none of these *cornua* be thrown up: but in the overturning of the earth by the deluge, these, with a thousand more productions of the sea, might be thrown from the bottom of the waters to the places where they are now found.

The *cornua Ammonis* are of different thickesses and lengths; some of them weigh twenty pounds. They are found in several places in Germany, and elsewhere. From some experiments that have been made, some of them are found to contain a little quantity of gold, which sinks to the bottom upon pounding them small, and stirring them in a running water, till all the earthy parts be carried off. Mr. Beaumont's account of them is to be seen in the *Phil. Transf.* N^o. 129. See *SNAKE-stones*.

CORNU Ammonis, in *Anatomy*, is a term applied to the great hippocampus. See *BRAIN*.

CORNU cervi, *hartshorn*, in *Medicine*, makes one of the testaceous powders. See *Hart's Horn*.

Among chemists, the same name is used for the mouth of an alembic.

CORNUA of the *os hyoideæ*, in *Anatomy*, are the two lateral portions of this bone. The *cornua minora*, or *cornicula*, are the two small portions of bone, which rest on the junction of the basis with the cornua. See *LARYNX*.

CORNUA pericardii; are the angles, formed where the bag of the pericardium is reflected over the root of the pulmonary artery and aorta, in its course to the surface of the heart itself. See *HEART*.

CORNUA of the *lateral ventricles*; a term applied to the different

different portions of these cavities; each of which has an anterior, a posterior, and an inferior or reflected, or descending horn. See BRAIN.

CORNUA exercitus, Lat. These were what the Romans called the horns of an army, literally speaking, and what we call the right and left wings. The *cornua exercitus* were composed, according to Polybius's account of the auxiliaries or allies, one half of them forming the right wing, and the other half the left wing, of a Roman army. They also encamped on the right and left of the Roman legions.

CORNUCOPIA, among the *Ancient Poets*, a horn, out of which proceeded plenty of all things: by a particular privilege which Jupiter granted his nurse, supposed to be the goat Amalthea.

The real sense of the fable is this: that in Libya there is a little territory shaped not unlike a bullock's horn, exceeding fertile, given by king Ammon to his daughter Amalthea, whom the poets feign to have been Jupiter's nurse.

In *Architecture* and *Sculpture*, the cornucopia, or horn of plenty, is represented under the figure of a large horn, out of which issue fruits, flowers, &c. On medals, F. Joubert observes, the cornucopia is given to all deities, genii, and heroes.

CORNUCOPIÆ, in *Botany*, (so called from the involucre enclosing the flowers, like a cornucopia or horn of plenty;) Lin. gen. 72. Schreb. 101. Willd. 120. Lam. Ill. 100. Juss. 33. Clafs and order, *triandria digynia*. Nat. Ord. *Gramineæ*.

Gen. Ch. *Involucre* one-leaved, funnel-shaped, many-flowered; mouth crenate, obtuse, spreading-erect. *Cal.* glume one-flowered, two-valved; valves oblong, obtusely acuminate, equal. *Cor.* one-valved; in figure, size, and situation much resembling the valves of the calyx. *Stam.* Filaments three, capillary; anthers oblong. *Pist.* Germ superior, top-shaped; styles two, capillary; stigmas cirrhus. *Peric.* none; corolla including the seed. *Seed* solitary, top-shaped, convex on one side, flat on the other.

Ess. Ch. *Involucre* one-leaved, funnel-shaped, crenate, many-flowered. *Calyx* two-valved. *Corolla* one-valved.

Sp. *C. cucullatum*. Linn. Sp. Mart. Lam. Willd. (*Juncus clavatus vaginatus*; Pet. gaz. tab. 73. fig. 5. *Gramen orientale verum*; Scheuch. gram. 117.) *Root* annual. Culms slender, jointed, bent at the joints, and dark purple, smooth, striated, a little branched. *Leaves* narrow, striated, smooth; sheaths inflated, spreading, pointed; stipule solitary, entire. *Peduncles* two or three, arising from the sheaths of the upper leaves, about an inch long, a little curved downwards, supporting the common involucre. A native of Asia Minor about Smyrna, introduced into England by Sherard, and sent to Linnæus by Hasselquist. One of the rarest and most singular of the gramineous plants.

C. alopecuroides. Linn. See PHALARIS *utriculata* and Dr. Smith in Linnæan Transactions, vol. vii. p. 245.

CORNUS, (κέρνικος; Theophras. *Cornus*; Plin. so called from the horny toughness of the wood.) Tourn. Cl. 21. § 9. gen. 1. Lin. gen. 140. Schreb. 194. Willd. 228. Gært. 151. Lam. Ill. 194. Juss. 214. Vent. 2. 605. Cornouiller; Enc. Cornel. Clafs and order, *tetrandria monogynia*. Nat. Ord. *Stellatæ* γ; Linn. *Caprifolia*; Juss.

Gen. Ch. *Cal.* Perianth superior, very small, four-toothed, deciduous. *Cor.* Petals four, lanceolate, acute, widely spreading. *Stam.* Filaments four, awl-shaped, erect, anthers egg-shaped. *Pist.* Germ inferior, roundish; style filiform, the length of the corolla; stigma obtuse. *Peric.*

Drupe roundish, umbilicated, succulent; nut egg-shaped, two-celled. *Seeds* one in each cell.

Ess. Ch. *Calyx* superior, four-toothed. *Petals* four. *Stigma* one. *Drupe* with a two-celled nut.

* Flowers umbelled, with a four leaved, coloured, involucre. Cornouillers. Fr. the male cornels of the old Botanists.

Sp. 1. *C. mascula*. Linn. Sp. Pl. 2. Mart. 2. Lam. 1. Ill. Pl. 74. fig. 1. Willd. 4. Gært. tab. 26. fig. 2. (α. *C. sylvestris* mas. β. *hortensis* mas. γ. *hortensis* mas, fructu ceræ coloris. Bauh Pin. 447.) Cornelian cherry. "Arboreous; involucre nearly equal to the umbels." In its wild state a shrub, four or five feet high; cultivated, a tree twenty feet high; young shoots cinereous, pubescent, slightly quadrangular. *Leaves* opposite, egg-shaped, acute, entire, somewhat hairy underneath, nerved, on short petioles. *Flowers* appearing early in spring before the leaves; yellowish; leaves of the involucre lanceolate, often reflexed; peduncles one-flowered, forming an umbel of from fifteen to twenty rays, a little longer than the involucre. *Fruit* oblong, about the size of an olive, generally bright scarlet, sometimes yellowish or wax-coloured. A native of woods and hedges in the south of Europe, very common in English plantations. The fruit has an astringent quality, and may be eaten either raw or in tarts; a rob made of it was formerly kept in the shops. The wood is highly commended for its durableness in wheel-work, pins, and wedges, and is said to last like the hardest iron. It flourishes under the shade of other trees. 2. *C. florida*. Linn. Sp. Pl. 1. Mart. 1. Lam. 2. Willd. 5. Bot. Mag. 526. Virginia dog-wood. (*C. mas virginiana*; Pluk. Alm. 120. tab. 26. fig. 3. Cateib. Car. 1. tab. 27.) "Arboreous; involucre very large, indented at the tip." A tree from ten to twenty feet high; trunk from eight to ten inches in diameter. *Leaves* opposite, larger than those of the preceding species, egg-shaped, acute or acuminate, green above, glaucous underneath, petioled. *Flowers* small, yellow; leaves of the involucre two inches broad or more, greenish white, sometimes rose-coloured, resembling petals, a little tomentous, ending in a short point, and appearing as if nipped almost double near the tip, which makes them seem emarginate and heart-shaped; peduncles one-flowered, forming close lateral and terminal umbels. A native of Virginia. In France and England it is seldom more than five or six feet high; but in the duke of Marlborough's garden at Sion-hill, there is a plant at least sixteen feet high, with a straight trunk about six feet in length before it branches, and measuring two feet in circumference a yard from the ground; it has long flowered freely, but has never produced fruit. The fruit in its native country is red, about the size of a haw, and is eaten by the celebrated mocking bird, *Turdus Orpheus* of Linnæus. 3. *C. fucica*. Linn. Sp. Pl. 4. Mart. 8. Lam. 4. Willd. 1. Flor. dan. tab. 5. Eng. bot. 310. (*Periclymenum humile*; Bauh. Pin. 302. *Chamaepericlymenum*; Cluf. pann. 87. tab. 88.) "Herbaceous. branches in pairs; umbel between the branches, peduncled; all the nerves of the leaves nearly distinct." *Root* perennial, creeping. *Stems* about six inches high, erect, quadrangular, leafy, bifid near the top. *Leaves* opposite, almost sessile, oval, acute, entire, smooth; all the nerves springing nearly from the base, and running nearly parallel. *Flowers* dark purple, small; leaves of the involucre large, white or reddish, permanent, finally becoming green and much enlarged; pedicels short, one-flowered. *Drupe*s globular, red, sweetish. A native of the northern parts of the Old Continent; rare in England having hitherto been found only in the hole of Horcum between Pickering and

Whitby in Yorkshire, about Castle dean in Durham, and on the Cheviot hills in Northumberland. In the Highlands of Scotland not uncommon, where the berries are eaten by children. 4. *C. canadensis*. Linn. Sp. Pl. 5. Mart. 9. Lam. 5. Willd. 2. P'Herit. corn. tab. 1. Bot. Mag. 880. (*Pyrola alpine* flore; Bauh. Pin. 191.) "Herbaceous; not branched; leaves in a single whorl at the top of the stem, on short petioles, veined in various directions from the midrib; umbel peduncled, rising from the centre of the whorl." *Root* perennial, creeping. *Stem* from six to eight inches high, naked below, with the exception of two opposite stipules a little below the middle. *Flowers* small, white, with a violet-coloured bottom: leaves of the involucre large, ending abruptly in a point, white, sometimes red at the tip; pedicels one-flowered, short. A native of Canada.

* Flowers in a cyme, not involucred; Sanguins; Fr. so called because the branches are red. The female cornels of the old botanists.

5. *C. sanguinea*. Linn. Sp. Pl. 3. Mart. 4. Lam. 6. Willd. 6. Fior. Dan. tab. 481. Eng. Bot. 249. Gært. tab. 26. fig. 1. Lam. Ill. Pl. 74. fig. 1. (*C. fœmina*; Bauh. Pin. 447.) "Branches erect; leaves egg-shaped, green on both sides; cymes depressed." A shrub from five to ten feet high; branches numerous, long, cinereous, but blood-red as they grow old, especially in winter. *Leaves* opposite, petioled, egg-shaped, quite entire, smooth, veined, becoming red late in the autumn, deciduous. *Flowers* greenish-white, with an unpleasant smell; petals revolute at the edges; germ crowned with a globular ring, into which the petals and stamina are inserted. *Drupe* globular, dark purple, very bitter, oily, styptic. Common in England and other parts of Europe. 6. *C. alba*. Linn. Mant. 40. Mart. 5. Lam. 7. Willd. 7. (*C. sylvestris fructu albo*; Amm. Ruth. 198. tab. 32. Mill. Pl. 104.) "Branches recurved; leaves broad-egg-shaped, hoary underneath; cymes depressed; berries white." A shrub from six to nine feet high; branches smooth, cinereous in summer, red in winter. *Leaves* opposite, petioled, ending in a point, larger than those of the preceding species, smooth on both sides, nerved. *Flowers* white, in terminal cymes; ring surrounding the germ purple. *Drupe* globular, of a transparent white colour. A native of Siberia and Canada. 7. *C. sericea*. Linn. Mant. 199. Mart. 6. Willd. 8. P'Herit. tab. 2. (*C. amomum*; Mill. Vogel. ic. rar. tab. 101. *C. cœrulea*; Lam. Ill. 1533. *C. fœmina baccis cœruleo-viridibus*; Gron. Virg. 20. *C. rubiginosa*; Ehrh. Beitr. 4. 15. *C. americana baccâ cœrulei coloris*; Pluk. alm. 121. tab. 169. fig. 3.) "Branches spreading; leaves egg-shaped, ferruginous silky underneath; cymes depressed; fruit blue." A shrub six feet high. *Stem* erect, cylindrical; branches opposite, dusky-purple; shoots with a ring at the joints, dark red. *Leaves* acuminate, entire, nerved. *Flowers* white. A native of North America. 8. *C. circinnata*. Willd. 9. P'Herit. Corn. tab. 3. (*C. rugosa*. Lam. 8. Ill. 1531.) "Branches warty; leaves orbicular, tomentous-hoary underneath; cymes depressed." A shrub six feet high. *Stem* upright, grey; branches opposite, somewhat spreading, cylindrical, green, with brownish warts; shoots with rings at the joints, purplish. *Leaves* three inches and a half long, and as many broad, opposite, ending in a point, smooth on both sides, wrinkled, nerved; petioles an inch long, semi-cylindrical, channelled. *Flowers* white, in terminal cymes; bracts two, bristle-shaped, situated near the base, or about the middle of two of the rays of the cyme. *Drupe* hollowed at the base, retaining the style, soft, pale blue, turning whitish. A native of Pennsylvania. 9. *C.*

strida. Mart. 11. Lam. 11. Willd. 10. P'Herit. Corn. tab. 4. "Branches stiff and straight; leaves egg-shaped, green on both sides, almost naked; cymes panicled." A shrub, fifteen or sixteen feet high. *Stems* several, upright, brownish; branches long, quite smooth, purplish, and somewhat angular near the top. *Leaves* opposite, petioled, acuminate, smooth, and shining on both sides, entire; petioles erect only one-sixth the length of the leaf, gibbous on one side, channelled on the other, purple. *Flowers* white; anthers pale blue, germ with a nectarous crown. *Drupe* soft, blue. A native of North America. 10. *C. paniculata*. Mart. 12. Willd. 11. P'Herit. corn. tab. 4. (*C. racemosa*; Lam. 10.) "Branches erect; leaves egg-shaped, hoary underneath; cymes panicled." A shrub six or seven feet high. *Stems* numerous, much-branched, cylindrical, grey; younger branches reddish-green, slightly angular. *Leaves* opposite, petioled, smooth, nerved. *Flowers* white, in nearly conical panicles; filaments yellowish white; germ with a purple crown. *Drupe* white, retaining the style. A native of North America. 11. *C. alternifolia*. Linn. jun. Supp. 125. Mart. 7. Lam. 9. Willd. 12. P'Herit. corn. tab. 6. "Leaves alternate." A shrub five or six feet high. *Stem* single; branches only from the upper part of the stem, spreading, cylindrical, smooth, and even; younger ones purple-violet, sprinkled with oblong, greyish dots or small lines. *Leaves* irregularly alternate, ovate-lanceolate, acute, entire, on rather long petioles, smooth, bright green above, whitish underneath, with lateral converging nerves. *Flowers* white, in a loose terminal cyme. *Drupe* globular, violet-coloured. A native of North America.

Propagation and Culture.—All the species may be raised from seeds, which should be sown in the autumn, soon after they are ripe. The shrubby ones are easily propagated either by transplanting the suckers or laying down the branches; but the layers produce the best plants.

CORNUS japonica; Thunb. See *VIBURNUM corniflora*.
CORNUS mas odorata; Pluk. Catseb. See *LAURUS sassafras*.

CORNUS racemosa trifolia; Plum. See *AMYRIS elemifera*.

CORNUS sylvestris, foliis croceum colorem tingentibus; Burm. See *MEMECYLON capitatum*.

CORNUS, or **CORNOS**, in *Geography*, a town in the island of Sardinia, marked in the itinerary of Antonine, on the route from Tibuli to Sulci, between Bosa and Tharri; now 18 miles S. E. of Bosa.

CORNUS, a small town of France, in the department of the Aveyron. It contains 991 inhabitants, and is the chief place of a canton, in the district of St. Affrique. The extent of the whole canton is 347 kilometres and a half. The number of its communes is 10, and that of its inhabitants 6360.—Also, a town of France, in the department of the Lot; 10 miles E. of Cahors.

CORNUTIA, in *Botany*, (so called from Cornutus, a French botanist.) Linn. gen. 766. Schreb. 1028. Willd. 1167. Juss. 107. Vent. 2. 319. Agnanthe; Enc. Class and order. *didynamia angiosperma*. Nat. Ord. *Perfonata*, Linn. *Vitices*, Juss. *Pyrenaceæ*, Vent.

Gen. Ch. *Cal.* one-tened, very small, five-toothed, permanent. *Cor.* monopetalous, tubular, two-lipped; tube cylindrical; upper lip with three nearly equal lobes; lower lip, three-lobed, the two lateral ones very small. *Stam.* filaments four, two of them projecting out of the flower. *Pist.* germ roundish; style very long, bifid. *Peric.* drupe globular, Vent.

Eff. Ch. Calyx five-toothed; two of the flaments projecting out of the corolla. Style very long. Drupe glo-bular.

Sp. 1. *C. pyramidata*. Linn. Sp. Pl. Mart. 1. Lam. 2. Willd. 1. Lam. Ill. Pl. 541. (*C. flore pyramidato*; Plum. gen. 32. ic. 106. fig. 1. *Agnanthus viburnifolius*; (Vaill. A&C. 1722, p. 273.) "Panicle terminal, naked, elongated; leaves egg-shaped, hoary, tomentous underneath." A shrub about twelve feet high; branches tetragonous, with sharp angles produced by the decumbent petioles. *Leaves* opposite, acute, soft. *Flowers* blue, in a long pyramidal panicle, consisting of opposite compound racemes; bracts narrow, acute, solitary, at the base of the peduncle of each raceme. A native of St. Domingo, Campeachy, and La Vera Cruz. Its wood is used to dye yellow. 2. *C. punctata*. Willd. 2. (*C. pyramidata*; Hort. Kew. *Holsta cœrulea*; Jacq. hort. Schoenb. 1. 60. tab. 114.) "Corymbs axillary, trichotomous; leaves egg-shaped, acuminate, nearly smooth." A shrub four-feet high, with quadrangular branches. *Leaves* opposite, petioled, somewhat toothed. *Flowers* in cymes, shorter than the leaves, blue, sprinkled with white glandular dots, scarcely visible without a magnifier. *Drupe* with a four-celled nut. A native of the warmer parts of America. 3. *C. quinata*. Mart. 3. Lour. cochinch. 387. "Flowers in racemes; leaves quinate, lanceolate, egg-shaped." A middle-sized tree, with spreading cylindrical branches. *Leaves* acuminate, quite entire, smooth on a long common petiole. *Flowers* greenish yellow; upper lip of the corolla trifid; lower bilid and shorter. A native of China in the woods near Canton.

Propagation and Culture.—The first species has long been propagated in England and France. It is raised from seeds sown early in spring on a hot-bed. The plants should be transplanted into pots, first smaller, and afterwards larger, according to their growth, and kept in a hot-bed of tanners bark, with a liberal allowance of water. In October they should be removed into the tan-stove, where they should remain in a moderate degree of heat during the winter. The third year they will flower and make a handsome appearance, but have never ripened their fruit in Europe. The plant may also be propagated by cuttings.

The cuttings should be made from proper shoots, and be planted in pots of light earth, at the same season, and managed afterwards in the same manner as those by seeds.

These shrubby plants afford a variety, when placed in assemblage with other exotics.

CORNUTIA corymbosa; Lam. See *CALICARPOS lanatus*.

CORNUTIA corymbosa; Burm. See *PREMNA integrifolia*.

CORNUTIOIDES, Flor. Zeyl. See *PREMNA ferratifolia*.

CORNUTUM ARGUMENTUM. See *DILEMMA*.

CORNUTUS, in *Biography*, a stoic philosopher, who flourished at Rome, was preceptor to the poet Persius, and himself esteemed as a poet, a grammarian, and stoic philosopher. He was one of the many victims sacrificed to the fury of the bloody Nero. A. D. 54. Moreri.

CORNUTUS pifeis, in *Ichthyology*, a species of *BALISTES*. See *BIACULEATUS*.

CORNWALL, in *Geography*, the name of the most western county of England, is nearly insulated by water; having the British Channel on the south, and the Bristol Channel on the north; both seas seeming to meet near the point called the Land's End, at the extremity of the promontory on the west: on the east it is separated from De-

vonshire, by the river Tamar, and an artificial boundary of a few miles at the northern extremity. From this boundary the land continually contracts its breadth to the westward, assuming something of the appearance of a cornucopia. The widest part of the county, from Morvinstow on the north, to the Rame-Head on the south, is about forty-three miles, but, from its rapid contraction, twenty miles may be considered as a medium. From Mount's bay to St. Ives, it is not more than five and a half miles across. The length of the north-east side from Morvinstow to the Land's End, is about ninety miles. The circumference is estimated at two hundred. There is a tradition that a considerable tract of land, named the Lionses, formerly connected with this county, and extending towards the isles of Scilly, was, at a very remote period, ingulphed by the ocean.

The original British name of Cornwall appears to have been *Cernyw*, i. e. a horn or promontory; and, is supposed, by Dr. Borlase, to have been changed, by the intercourse of the natives with Romans, into the Latin term *Cornubia*, "which it retained till the Saxons imposed the name of *Wales* on the Britons, driven by them west of the rivers Severn and Dee, calling their country in the Latin tongue, *Wallia*; after which, finding the Britons had retreated, not only into Wales, but into the more western extremities of the island, the Latinists changed *Cornubia* into *Cornwallia*; a name not only expressive of the many natural promontories of the country, but also that the inhabitants were Britons of the same nation and descent as those of Wales; and from this *Cornwallia*, is derived the present name *Cornwall*." Borlase's *Antiquities of Cornwall*. This portion of the kingdom was included by the Romans under their first division, *Britannia Prima*; but antiquaries differ as to the extent of the Roman dominion in this part of the country. It is supposed that the Romans made an actual conquest of Cornwall about the same period that Claudius subdued the southern part of the island: this opinion is strengthened by many coins, pavements, urns, and sepulchres that have been discovered in different parts of the county, chiefly within the last century; and is further confirmed by the form of various forts, encampments, and road-ways. Dr. Borlase observes, that the collective mass of evidence, in favour of the Roman domination here, is so strong, that "it cannot be contradicted." Cornwall, from its soil, appearance, and climate, is apparently one of the least inviting of the English counties. A ridge of bare and rugged hills, interspersed with bleak moors, runs through the middle of it. The roads, which are chiefly carried over the higher lands, or extensive commons, convey to the traveller a much greater idea of sterility than the produce of the country will warrant; for marks of abundant fertility are displayed in the vallies, and on the sea-shores; the use of the sea-sand and weeds collected on the beach, greatly increasing the richness of the soil. The surrounding body of water renders the air extremely moist; and the interception of the clouds, by the central high lands, occasions frequent and heavy showers: these, however, are of short duration, and may be considered as conducive to health, by dissipating the noxious vapours arising from the processes of refining the ores, and introducing the vivifying qualities wafted by the genial breezes from the ocean. The seasons are more equal than in most parts of England, being generally free from intense heat or piercing cold. Frosts seldom continue long; and the snow scarcely ever continues on the ground longer than two or three days. The sea-air is considered as injurious to vegetation, the salt particles wherewith the atmosphere is impregnated, together with the violence of the

CORNWALL.

winds, prevent the growth of trees on the coasts; and it is only in the sheltered vales that the ancient natural woods are to be found. The attempt to raise plantations, in situations exposed to the south-west and northerly blasts, was hardly ever successful till within these few years, when more promising indications have attended it; the pine-after fir being first planted as a shelter to the more tender trees. The art of husbandry appears to have been but little practised in this county, so late as three centuries ago. "Their grounds," says Mr. Carew, "lay all in common, or only divided by tithe meale, and their bread corn very little: their labour heres were only shod before; and the people devoting themselves entirely to tin, their neighbours in Devonshire and Somersetshire hired their pastures at a rent, and stord them with the cattle they brought from their own homes, and made a profit of the Cornish, by cattle fed at their own dooms. The same persons also supplied them at their markets with many hundred quarters of corn, and horse-loads of bread." Borlase, in his observations on this passage, remarks, that "the people increasing, and the mines sometimes failing, the Cornish felt the necessity of applying themselves to husbandry; and their improvements answered their expectations; for, in the latter end of the reign of Queen Elizabeth, they found themselves in a capacity not only to support themselves, but also to export a great quantity of corn to Spain and other foreign parts." The agriculture of Cornwall is, notwithstanding, still but a secondary object. The portable commodities of the county are chiefly carried on the pack-saddle; and the hills and steep acclivities rendering the use of sure-footed animals necessary, the breeding of mules has been successfully attended to. Great numbers are employed in carrying the produce of the mines: the price of a good mule is frequently eighteen or twenty guineas. The common horses, though small, are hardy and well adapted to a hilly country. The vegetable soils are extremely various, but their general distinctive characters may be arranged under the heads, *black growan* or gritty, and the *shaly* or *slaty* soil. The former abounds in the high lands, the upper stratum chiefly consisting of a light black earth, intermixed with small gravel, the detritus of *granite* or *growan*, and hence the soil receives its appellation. This stratum, on the tops and sides of mountains, is very shallow, and not of considerable depth even on the more level and extensive wastes: its natural produce is a thin short heath, and the dwarf, or Cornish furze. A stratum of a cubical quartz is generally found beneath, of various sizes, and from four to eight inches thick; and below this a whitish or yellowish loamy clay. By digging up the quartz, and intermixing the under stratum of clay with the growan earth on the surface, a prolific soil is produced, fit for any kind of grass. The coasts of Cornwall abound with a great variety of fish; one species of which, the *pilchard*, is taken in sufficient quantity to constitute a considerable and productive branch of commerce. See PILCHARD.

"The sea," says Borlase, "is the great store-house of Cornwall, which offers not its treasures by piece-meal, nor all at once, but in succession: all in plenty in their several seasons, and in such variety, as if nature was solicitous to prevent any excess or superfluity of the same kind." In this author's "Antiquities of Cornwall," the numerous species of fish that visit this coast are particularly described. The sea-sands round Cornwall probably exceed in variety those of any other county in Great Britain; the sand of every cove being different. The sand of a particular shore, cove, or bay, has generally the same colour; and a microscope shews it to be of the same substance as the adjacent cliffs, and the strata under the sea. Clays are found in this

county in great variety, and many of them are eminently useful for different purposes of manufacture. The yellow clay, in St. Kevran's parish, is esteemed but little inferior to any, for cauling in silver, brass, or lead; the yellow clay from Lannant is much valued for building furnaces, as the bricks made with it are supposed to have a peculiar faculty of withstanding intense heat.

The mineralogical substances of Cornwall are far more abundant than those of any district of the same extent in the world; and the scientific inquirer finds in their beauty and variety a proportionable field for his researches. Among the rocks claiming especial notice, is granite, or, as here called, *moor-stone*, of which this county affords more than any other part of England. It forms the chain of mountains, which, commencing at Dartmoor, runs through Cornwall to the sea at the Land's End, and to the northward and southward goes into primitive schists. Granite is an aggregate of felspar, quartz, and mica; and the varieties found here are innumerable, both in the size and colour of its component parts. Between the town of Liskeard and the river Tamar are some quarries of slate; whence the inhabitants of Plymouth are supplied with covering for their houses, and for the purpose of exportation. The free-stone is of two sorts: one composed of sand and argil, the other of sand and quartz: that of the purest quality is found in the parishes of Carantor and the Lower St. Columb, and approximates to the Portland and Bath stones. The Polrudon or Pentowan stone is likewise of a sandy nature: it lies in irregular masses of three different colours, in a shelving lode about 15 feet in width. A curious production, called the *swimming-stone*, has been discovered in a copper mine near Redruth; it is of a yellowish colour, and consists of quartz in right-lined laminæ, as thin as paper, intersecting each other in all directions, but leaving unequal cavities between them: this cellular structure renders the stone so light, that it swims on water, whence it obtained its name. Some beautifully transparent quartz are found here, crystallized in six-sided pyramids, with a correspondent hexagonal prism. That part of the county which forms the Lizard Point is composed of serpentine and hornblende of the most beautiful kind, including every shade of green, from pea-green to black, variegated by tints of purple and scarlet. The serpentine is occasionally intersected with veins of the *steatites*, so called from the Greek word for tallow, to which it has some similarity. But this curious substance is contained in the greatest abundance in the celebrated *soap-rock*, situated between the Lizard and Mullion: it is of whitish or straw colour, with veins of green, red, and purple. When embedded in its matrix, the serpentine, it feels wet, and may be compressed with the hand; but being exposed to the air, becomes indurated, and of a soapy texture. The whole soap-rock is rented by the proprietors of the porcelain manufactory at Worcester. It is remarkable, that letters written with soap-stone (*steatites*) upon glass, though insensibly fixed, are not to be moved by washing, but always appear on being moistened with the breath. Solid asbestos is often seen adhering to the pure specimens of the *steatites*, and is also spread, like a thin film of enamel, on the surface of some rocks exposed to the sea. The fibrous asbestos has been discovered in St. Cleer's parish, fixed to stones of the killas kind, and sometimes running through them in a wavy line. But the most important of Cornish fossils is the *china stone*, obtained in the parish of St. Stephen, near St. Austel, and forming a principal ingredient in the Staffordshire pottery. It is a decomposed granite, the felspar of which is deprived of fusibility. Its qualities were, about 40 years ago, discovered by chance, and it has since been an article of considerable traffic;

traffic; many ship-loads being annually sent from a small sea-port called Charles-Town. Retorts and crucibles of an excellent fire-proof nature have been manufactured from it at Truro.

The chief objects of consideration, in the history of Cornwall, are its numerous mines, which have supplied thousands of its inhabitants with employment for many centuries; and in remote periods constituted, by their produce, the chief staple of British commerce. At present these subterranean sources afford very considerable revenues; and the trade to which they give birth, considered in a national light, is of the highest relative consequence. "In a narrow slip of barren country," says the author of the General View of Cornwall, "where the purposes of agriculture would not employ above a few thousand people, the mines alone support a population estimated at nearly 60,000, exclusive of the artizans, tradesmen, and merchants, in the towns of St. Austel, Truro, Penrhyn, Falmouth, Redruth, Penzance, and some others." The number of men, women, and children, whose subsistence is derived immediately from the mines, by raising, washing, stamping, and carrying the ore, is reckoned at 14,000. The principal produce of the Cornish mines is tin, copper, and some lead. The strata on which these metals are found, extend, in a direction from west to east, from the Land's End entirely through the county into Devonshire, where, and in the eastern parts of Cornwall, immense quantities of tin were formerly raised: but the chief seat of *mining* now lies in the neighbourhood, and to the westward of St. Austel; whence to the Land's End the principal mines are to be found, extending along the northern coast, and keeping a breadth of about seven miles. Most of the metals are found in veins or fissures, which are here called *lodes*. These fissures have generally an east and west direction; but differ in breadth, depth, and length, as well as in the density of their sides or walls.

The most valuable metal produced in Cornwall is tin, which is sometimes found collected and fixed, at others loose and dilated. In its fixed state, it is either in a lode or floor, which is an horizontal layer of the ore; or interspersed in grains and small bodies in the natural rock. The floors are frequently deep, and very rich; but the working is attended with considerable expence, from the quantity of large timber required for the support of the several passages of the mines. The same lode, that has been perpendicular for several fathoms, is sometimes suddenly extended into a floor. Tin, in its dispersed form, is found either in a pulverised sandy state, in separate stones called *shodes*; or in a continued course of stones, sometimes in such numbers as to extend to a considerable length, and from one to ten feet in depth. This course is called a stream; and when productive of a large quantity of metal, it obtains the name of *beubeyl*, the Cornish word for *living stream*; and by the same figure, when the stone is but lightly impregnated with tin, it is said to be *just alive*: when it contains no metal, it is called *dead*; and the heaps of rubble are emphatically styled *deads*. (See TIN.) Ancient historians mention the tin of Cornwall, of the isles of Scilly, and of Devon, as a branch of commerce between the Britons, and the Phœnicians, and Grecians, several centuries prior to the Chrillian era. The Phœnicians were the first who trafficked in this article; and Strabo reports, that they were so strenuous in their endeavours to conceal from other nations the places whence they obtained it, that the master of a Phœnician vessel, supposing himself pursued by Romans for the purpose of discovery, ran upon a shoal, and suffered shipwreck, rather than permit the tract to be made known. During the Saxon dominion, the working of the mines was, through intestine commotions

and the inroads of the Danes, entirely neglected. The Normans are said to have derived great emolument from working them; but this seems doubtful, as, in the reign of king John, their produce was so trifling, that the *tin-farm* amounted to only 100 marks. In the next reign it was greatly increased. Under Edward I. a charter was obtained, by the lords of the seven tythings best stored with tin, from Edmund, earl of Cornwall, with more "explicit grants of the privileges of keeping a court of judicature, holding places of actions, managing and deciding all stannary causes, of holding parliaments at their discretion, and of receiving, as their own due and property, the toll-tin, or the fifteenth part of all tin raised." The encouragement for searching for tin seems to have been, at this period, first appointed, or at least more permanently regulated. For these privileges, the landholders obliged themselves to pay to the earls of Cornwall, for the time being, four shillings for every hundred weight of white tin. This charter was confirmed 33 Edw. I., with the additional privilege of a coinage, and a general licence to dispose of the tin. These grants were confirmed and enlarged by parliament, in the reigns of Richard II. and Edward IV. The original stannary towns of Cornwall were Launceston, Lottwithiel, Truro, and Helston. To these places the tanners were obliged to convey their metal every quarter of a year; but in the reign of Charles II., Penzance was added, to accommodate the western tanners. All tin ores are wrought into metal in the county, and then cast into blocks, weighing from two hundred and three quarters to three hundred and three quarters each. These are not saleable till assayed by the proper officers, and stamped with the Duchy seal. Since Henry VIII.'s time, these *coinages*, as they are termed, have been held at the regular quarter days. The annual produce of the tin-mines is about 25,000 blocks, which, exclusive of duties, may be estimated to afford an income of 260,000*l.*; the average value of each block being nearly 10*l.* 10*s.* The income of the duchy derived annually from this source is about 10,000*l.* From the great exportation to China and India, the trade has been very flourishing; but from the great depth of the mines, and the high price of materials, the spirit of adventure has been considerably depressed, and the business consequently injured. Cornwall affords copper ores in great abundance and variety. Native copper is sometimes found on the sides of fissures in thick films, deposited by the impregnated water proceeding from the lodes. Veins of copper are frequently discovered in cliffs laid bare by the sea; but the most encouraging symptom of a rich ore is an earthy ochreous stone, called *goffan*, similar in colour and texture to the rust of iron. (See COPPER.) The manner of cleansing and dressing the ore is partly the same as that employed for tin; but being generally raised in larger masses, it requires less washing. In the smelting houses at Hale, the furnaces are all reverberators; and those used for the process of roasting will contain about three tons and half of ore, reduced to small pieces. Lead-mines are not numerous in this county, though the ore has been found in many parts, and generally incorporated with silver. The ores are of very different kinds; but that most frequently discovered is *galena*, or pure sulphuret of lead, both crystallized and in masses. It is foliated, and of a blueish grey colour. (See LEAD.) Gold, though frequently found here, has never been in sufficient quantity to warrant the engaging in any expensive operations to obtain it. Silver is reported to have been raised here in such quantity, in the reigns of Edw. I. and Edw. III., as to have enabled them, in a great measure, to defray the charges of the wars they were engaged in. The produce

became afterwards so inconsiderable, that the mines were entirely neglected till the sixteenth century, when an unsuccessful effort was made, after which the search was again discontinued. This county affords abundance of iron ores, but the distance of coal renders the expence of working greater than the value of the iron produced. The ore has been lately shipped in great quantities for Wales. Sulphuret of iron, or *pyrites*, called by the Cornish miners *mundic*, from the resplendent appearance of its surface and structure, abounds here in a great variety of form and combination. It is intermixed with most copper lodes, and, from the closer consilience of the copper ore, is easily separated, either by hammers, washing, or evaporation. The principal semi-metals of Cornwall are bismuth, zinc, antimony, cobalt, arsenic, wolfram, menachanite, and molybdena, or sulphuret of molybdenum. Bismuth, in the ore, is usually of bright silvery white, and its structure irregularly foliaceous. Lapis calaminaris, or calamine, is an ore of zinc, produced here in great abundance, and of a very superior quality. Antimony is found in several mines in the parish of Endeliana: it runs in veins, mixed with a small quantity of copper and lead. Cobalt is found in various parts of the county, but the quantity is inconsiderable. Arsenic is generally combined with other ores, whence roasting disengages it. Wolfram is met with in several places, particularly in the mine called Poldice. Menachanite was the name given, by the Rev. Mr. Penrose of this county, to a substance resembling gunpowder, lately discovered in large quantities in the vale of Menahan. Molybdena, which is the only species of molybdenum yet found, is commonly in masses; but sometimes crystallized in hexaedra tables.

Cornwall contains more parliamentary boroughs than any other county in the kingdom, and the number of its representatives is consequently greater: it returns no less than *forty-four* members; many of them from places very inconsiderable as to trade, wealth, or population. This pre-eminence is not of very ancient date: it appears to have arisen from the large hereditary revenue accruing from the duchy to the crown, or to the immediate heir, the prince of Wales. In Edward I.'s reign, only the county, and the five boroughs of Launceston, Liskeard, Truro, Bodmin, and Helton, had the privilege of representation. Lothwithiel was added to the number, *temp.* Edw. II. No further addition was made till near the end of Edward VI.'s reign, when this right was granted to Saltash, Camelford, West Looe, Grampond, Boffiney, St. Michael, and Newport. In the first of Mary, Penrhyn was admitted into the list; and three years afterwards, St. Ives. At various periods in the reign of Elizabeth, the same honour was extended to Tregony, St. German's, St. Maw's, East Looe, Fowy, and Cullington; which increased the number of boroughs to twenty-one. Eight of these had either an immediate or a remote connection with the demesne lands of the duchy; and four devolved to the crown, on the dissolution of the monasteries. The names of many of the ancient towns of Cornwall, its castles, rivers, mountains, manors, seats, and families, are derived from the Cornish tongue; whence most of the technical appellations in mining, husbandry, and fishing, may also be traced: but the language itself is no longer remembered. The last person known to speak it was an old woman, of whom some account was given by the Hon. Daines Barrington in 1768, and printed in the *Archæologia*, vol. iii. (See *CORNISH*.) The waste-lands may be estimated at nearly one-fifth part of the county: a considerable portion of these consists of marshy grounds, intermixed with rocks and mountains. The duchy-lands, which are far more extensive than those of any other proprietor, are mostly held

on leases for lives, renewable for a fine certain, or calculated on their improved value: the income derived from them, and that from the duty on the coinage of tin, are the only parts unalienated of the immense hereditary revenues, which formerly constituted an independent provision for the heir-apparent to the crown. This fortune was originally bestowed by Edward III., in the eleventh year of his reign, on his eldest son, Edward the Black Prince, whom he created duke of Cornwall, by the "investiture of a wreath, a ring, and a silver rod." By a special act then passed, the title and duchy were limited to the first begotten son of the prince, and his heirs, being kings of England, for ever: and from that period the eldest son of the sovereign is presumed to be of full age on the very day of his birth, and immediately has entire livery of all the possessions connected with the duchy. Some portions of the revenues have been, at different times, distributed in a manner unauthorized by the original grant, which expressly provides against any alienation: yet several have been disposed of, by an act passed in the present reign. It appears also, from a recent debate in the house of commons, that, during the minority of the present prince of Wales, upwards of 300,000*l.*, arising from the duchy revenues, had been appropriated to the civil list expenditure, and other public uses.

The principal rivers of Cornwall are the Tamar, the Lynher, the Looe, the Fâwy, the Camél or Alan, the Fal, the Loe, the Hêl, and the Hêyl.

Cornwall is in the diocese of Exeter, and in the western circuit. It contains about 780,500 acres, is divided into nine hundreds, and comprehends 201 parishes, and 23 market towns. In the return to parliament in 1801, the number of houses was 34,378, of inhabitants 188,269. This county sends 640 men to the militia, and pays eight pence to the land-tax. The assizes are held alternately at Launceston and Bodmin. Borlase's *Antiquities of Cornwall*, fol. Pryce's *Mineralogia Cornubiensis*, fol. Beauties of England and Wales, vol. ii.

CORNWALL, a township of America, in Addison county, Vermont, E. of Bridport, on lake Champlain, containing 826 inhabitants.

CORNWALL, *New*, a township in Orange county, New York, of whose inhabitants 350 are electors.

CORNWALL, a township in Litchfield county, Connecticut, about 9 miles N. of Litchfield, 11 S. of Salisbury, and about 40 W. by N. of Hartford city.—Alfo, a small town in Upper Canada, on the bank of Iroquois river, near lake St. Francis, between Kingston and Quebec, containing a small church, and about 30 or 40 houses.

CORNWALL, one of the three counties into which the island of Jamaica is divided: the other two being Middlesex and Surry. Cornwall contains five parishes, three towns, and six villages. The towns are Savanna-la-Mar, on the S. side of the island, and Montego-bay and Falmouth on the north. An assize court for the county of Cornwall, is held every three months in Savanna, which begins the last Tuesday in March, June, September, and December; and each assize court is limited to a fortnight in duration. The number of effective men raised in this county in 1792, consisted of 368 cavalry, and 2305 infantry.

CORNWALL, *Cape*, the name given by captain Cook to the S.W. point of the largest island on the N.W. side of the passage called Endeavour straits, near Possion island, on the eastern coast of New Holland, or New South Wales, S. lat. 10° 43'. W. long. 219°.

CORNWALLIS, a town of America in King's county, in the province of New Brunswick, situated on the S. W. side

W. side of the basin of Minas; 18 miles N.W. of Falmouth, and 55 N. W. of Annapolis.—Also, a river, in the same province, navigable for vessels of 100 tons 5 miles; for vessels of 50 tons 10 miles.

CORNY, a town of France, in the department of the Moselle, and district of Metz; $2\frac{1}{2}$ leagues S. of Metz.

CORO, a town of South America, in the government of the Caraccas, situated upon an arid sandy soil, full of cacti, nopals, and Indian figs. It was the seat of government from the time of its foundation in 1527 to 1576, when the governor Pimentel removed his residence to Caraccas. It has some commerce with Curassao, and a population of about 10,000 persons. Its port lies open from N. to N. E.; but neither its commodities nor accommodation make it a port of great resort. N. lat. 11° . W. long. $72^{\circ} 30'$.

COROBILIUM, CORBEILLE, in *Ancient Geography*, a place of Gaul, placed in Peutinger's table between Durocororum and Andomatunum.

COROCONDOMA, a town of Asia, situated at the entrance of the Cimmerian Bosphorus, on the Euxine sea. There was an island of the same name: and near the town was a large channel formed by the waters of the Euxine sea.

COROCORO, in *Ichthyology*, the name of a Brazilian fish, somewhat resembling the Coracinus of the Mediterranean. It has a sinus in the back, in which, at pleasure, it can bury the fins. Marggrave's Hist. Brasil.

CORODAMUM, in *Ancient Geography*, a promontory of Arabia Felix, on the eastern coast of the Persian gulf; now called *Cape de Rasfalgate*.

CORODIO *habendo*, a writ, whereby to exact a *corody* of an abbey or religious-house.

CORODY, COROFODY, or *Corredy*, in *Lazv*, (*corrodium*, from *corrodo*, also *conredium* and *corredium*), a sum of money, or allowance of meat, drink, and cloathing, due to the king from an abbey, or other house of religion, whereof he is the founder, towards the reasonable subsistence of any servant he thinks fit to bestow it on.

The difference between a corody and pension is said to be, that a corody is allowed towards the maintenance of any of the king's servants in an abbey; but a pension is given to one of the king's chaplains, for his better maintenance, till he may be provided with a benefice. See Fitzherb. Nat. Br. fol. 250. who sets down all the corodies and pensions certain, that abbeys, when they stood, were bound to perform to the king.

CORODY also denotes the right belonging to the king of sending one of his chaplains to be maintained by the bishop, or to have a pension allowed him till the bishop promotes him to a benefice. This is also in the nature of an acknowledgment to the king, as founder of the see, since he had formerly the same corody or pension from every abbey or priory of royal foundation. It is now fallen, as judge Blackstone apprehends, into total disuse; though sir Matthew Hale says, that it is due of common right, and that no proscription will discharge it.

CORODY is also a right of sustenance, or of receiving certain allotments of victual and provision for one's maintenance. (Finch. L. 162.) In lieu of which, especially when due from ecclesiastical persons, a pension or sum of money is substituted. These corodies may be reckoned a species of incorporeal hereditaments; though not chargeable on, or issuing from, any corporeal inheritance, but only charged on the person of the owner in respect of such of his inheritance.

COROLIA, in *Ancient Geography*, a town of Arabia Felix, which Pliny places on the coast of the Red Sea.

COROLLA, in *Botany*, (*coronula*, a little crown), vulgarly called the leaves of a flower, consists of those more delicate and dilated, generally more coloured leaves, which when the calyx is present are internal with respect to that part, (see CALYX,) and always external with regard to the more essential parts, the immediate organs of impregnation, denominated *Stamina* and *Pistilla*. The Corolla constitutes the chief beauty of flowers, and is commonly the seat of their most splendid colours, as well as of their fragrance. Its forms are extremely diversified. It is either monopetalous, consisting of one leaf or petal, or polypetalous, composed of several. In either case it is called regular when its general figure is uniform, as in a primrose or snowdrop; or irregular when otherwise, as in a snapdragon or violet. A regular corolla is called equal when all its divisions are of the same size, as in a strawberry blossom, but the snowdrop has an unequal corolla. Under the name of Corolla two distinct parts are often comprized, the petal or petals, and the nectary; see NECTARIUM. The latter however is sometimes of a glandular nature, totally distinct from the corolla. A monopetalous corolla is moreover composed of two parts, *tubus* the tube, and *limbus* the limb: the analogous portions of a polypetalous one are expressed by the terms *unguis* the claw, and *lamina* the leafy expansion or border. The Corolla is simple in most flowers; compound in the great natural class *Syngenesis*, exemplified by the Daisy, Dandelion, and Sunflower, as well as in the Scabious and some others.

A monopetalous corolla may generally be referred to one or other of the following forms, which are necessary to be known, not so much for the understanding of the systems of Tournefort, or Rivinus, now obsolete, but because the generic distinctions of plants are by all botanists founded more or less upon such differences. They are exemplified in our Plates of BOTANY, *Tournefort's System*, 1, 2 and 3.

Corolla campanulata, bell-shaped, as in *Atropa*, Pl. I. cl. 1. fig. 1.; and *Campanula*, fig. 7.

Infundibuliformis, funnel-shaped, *Nicotiana*, cl. 2. fig. 2.

Hypocrateriformis, salver-shaped, *Primula*, cl. 2. fig. 1.

Rotata, wheel-shaped, *Borago*, Pl. II. cl. 2. fig. 4.

Ringens, ringent, irregular and gaping, called by the older botanists, before Linnæus, *labiata*, as in *Lamium*, Pl. II. cl. 4. fig. 2.

Personata, personate, irregular and closed by a sort of palate, as *Antirrhinum*, cl. 2. fig. 4.

A polypetalous corolla appears under the following shapes.

Cruciformis, cruciform, like *Raphanus*, Pl. III. cl. 5. fig. 1.

Lunaria, fig. 6; as well as the common stock and Wallflower.

Rosacea, rosaceous, like the rose, as also *Papaver*, cl. 6. fig. 5. and *Nymphaea*, fig. 8.

Papilionacea, papilionaceous, as in all the pea kind.

Incompleta, incomplete, when some part or parts which analogy would lead us to expect, are wanting, as in *Amorpha*, Bastard Indigo, a papilionaceous flower in habit and appearance, but consisting of only the large upper petal or standard. See PAPILIONACEOUS.

An irregular corolla varies occasionally to a regular one, even in the same species. Of this the common yellow Toad-flax, *Antirrhinum Linaria*, affords a celebrated example, on which Linnæus has written a dissertation in the *Amœnitates Academicae*, v. 1. 55. t. 3, under the name of *Peloria*; nor is this by any means a solitary instance of such a transformation. See PELORIA.

Linnæus considered the corolla as originating in the liber or inner bark, but more correct ideas of the structure and physiology:

physiology of plants render this hypothesis totally untenable. See CORTEX.

The whole use and physiology of this part have not yet been generally explained or understood. That it protects the tender organs of impregnation, whose functions are liable to be frustrated by wet, is evident in many cases, though not in all. Linnæus imagined that the action of the wind, on the thin expanded form of the petals, made them serve as wings to waft the flower up and down in the air, and thus promoted the diffusion of the pollen over the organs it was destined to impregnate. Of this there can be no doubt, but such a purpose is by no means universally answered by the organ in question. It must be evident to an attentive observer, that the probable use of the corolla is closely connected with air and light, especially if we take into consideration its cellular texture, and its vivid colours, for the latter are known to have a most intimate dependence upon light; and even the corolla itself is manifestly, in many instances, stimulated by the solar rays in an eminent degree, folding itself up when they are even partially withdrawn. The *Crepis rubra*, Pink Hawkweed, if gathered in bright weather, closes its flowers when placed in a room; but after the darkness of night has passed over them, those very flowers will expand and remain open in a degree of light not sufficient to keep expanded others that have more recently been exposed to the meridian sun. It is to be presumed therefore that the corolla performs some functions with respect to air and light, serviceable to the Stamens and Pistils, analogous to what the leaves perform towards other parts of a plant, but not exactly conformable to them.

A German author, named Sprengel, has written an elaborate work for the purpose of demonstrating, in some hundreds of instances, how the corolla serves to attract insects, not only by its form and general beauty, but often by peculiar spots or marks, called by him *macule indicantes*, serving to point out the precise situation of the honey of which those industrious little animals are in search. While they plunder the flower of its sweetness, they in return serve the most important purpose, by promoting the access of the pollen to the stigma, and so rendering the seeds fertile. See IMPREGNATION OF PLANTS.

That the corolla has a more intimate connection with the vegetable impregnation, than even the above elegant theory of Sprengel is sufficient to account for, appears from its different degrees of duration in double flowers and in single ones. In some of the latter it falls almost as soon as the petals are well expanded, especially in warm weather; in double flowers, on the contrary, whose organs of impregnation are obliterated, its vital principle is not so soon exhausted, and it remains several days, just as happens also to premature single blossoms in the cold of winter, that ripen no seed.

Whatever the use of the corolla may be, it is not an organ essential to all plants. The calyx, perhaps, or even the filaments of the Stamens, appear occasionally to answer its purposes. Hence a difficulty arises among systematic botanists, when a flower has only one leafy covering, to determine whether it should be called a corolla or calyx. In most cases analogy will enable us to decide this. The calyx is usually of a green colour, and thick coarse texture, like the leaves, and all botanists are nearly agreed in calling by that name any single covering which answers this description. They even go further, and denominate calyx the beautifully coloured leaves of some flowers which agree in natural affinity with the former. Thus *Polygonum*, or Knot-grass, is universally allowed to have a coloured calyx, and very justly, for as the seed ripens, the part in question often becomes

thicker, as well as of a green hue, assuming the usual habit of the calyx of its natural ally *Cheucopodium*. *Daphne*, the Mezereon, however beautiful and fragrant, has but a coloured calyx, which is evinced by *Gnidia*, its near relation, bearing petals besides. Perhaps by the same rule the whole order of Liliaceous plants, the nobles of the vegetable kingdom, will be proved to have in general only a coloured calyx, notwithstanding the splendour with which that part is adorned; for we have lately become acquainted with a new genus, near *Agapanthus*, of this tribe, with six petals besides its coloured calyx. See *Introduction to Physiological and Systematical Botany*, p. 263. The cup or crown of the Narcissus thus becomes a true corolla, and the six leaves which surround it a calyx, the spathe or sheath being, certainly with no impropriety, esteemed a bractea. This manner of understanding the flowers in question will not however accord with the hypothesis of Mr. Salisbury, published in the eighth volume of the Linnæan Society's Transactions, the chief purpose of which is to shew that the lamina are never inserted into the calyx, though often, as every body knows, into the corolla. It is much to be wished that so commodious a distinction were to be depended upon. It may serve, in some instances, but in others we apprehend it must fail. For instance, it is too paradoxical to call the lower part of the tube in the beautiful scarlet calyx of *Fuchsia*, into which the petals and lamina are inserted, a receptacle, any more than the analogous portion of the flower in *Colchicum* or *Agapanthus*, which the new genus abovementioned, allied to the latter, proves to be a calyx as much as that of *Fuchsia*. If this difficulty can be got over, we should be much satisfied, for we do not propose it from any love of contradiction. We believe that no absolute distinction exists, in every case, between the calyx and corolla, and that the very same part, externally green and coarse, may be so far of the nature of a calyx, while its delicately coloured and polished inner surface may be altogether analogous to a distinct corolla. Of this *Ornithogalum*, and *Narthecium*, *Engl. Bot. t. 535*, are instances. It is proper to mention the rule proposed by Linnæus for distinguishing the parts in question, that the laminae are placed opposite to the segments of the calyx, and alternate with the parts of the corolla. This accords, as Adanson observes, with the Liliaceous family as above explained, though Linnæus did not so understand their parts, and we apprehend it will hold good more generally than even its author believed. It can only serve however when the stamens are of the same number as the segments or petals of the corolla or calyx.

The corolla is sometimes deficient in certain species of a genus, though others of that genus are furnished with it, as in *Sagina apetala*, and the earlier flowers, occasionally, of *Ranunculus auricomus*, *Engl. Bot. t. 624*. A new-simple-leaved species of *Ceratopetalum*, *Bot. of New Holland, t. 3*, has also been discovered without petals. Hence we learn that the corolla is not only unessential to a flower in general, but, in some cases, even to the definition of a genus or species. S.

COROLLARY, or CONSEQUENTARY, in *Mathematics*, is used for a consequence drawn from some proposition already advanced or demonstrated: as if from this theorem, "That a triangle which has two equal sides, has also two equal angles," this consequence should be drawn, "that a triangle, which hath the three sides equal, has also its three angles equal."

COROLLISTÆ, among *Botanical Authors*. See BOTANY.

COROLLULA, among *Botanists*, a term used to express those little partial flowers, which together constitute physiology

the whole compound ones. They are of two kinds, the tubulated, and ligulated; the former are always furnished with a campanulated limb, divided into four or five segments: the latter, or ligulated corollulæ, have a flat linear limb, terminated by a single point, or by a broader extremity, divided into three or five segments.

COROMANA, or **COROMANE**, in *Ancient Geography*, a town of Asia, situated on the Persian gulf, according to Steph. Byz. It is probably the same place which is called by others Coromanis, and referred to the eastern coast of Arabia Felix.

COROMANDEL, **COAST OF**, in *Geography*, the eastern coast of Hindoostan, along the Carnatic, extending from Point Calymere, in N. lat. $10^{\circ} 20'$. E. long. $79^{\circ} 54' 30''$; to the mouth of the Kistnah river, in N. lat. $15^{\circ} 45'$. E. long. $80^{\circ} 10'$. The geography of this coast is settled upon unexceptionable authorities by major Rennell, who observes, that it has no port for large ships.

CORON, a Jewish liquid measure, supposed to be the same with the homer.

CORON, in *Geography*, a sea-port town of European Turkey, in the Morea, situated on a gulf of the same name, anciently called "the gulf of Messina," with a large harbour. This place was taken from the Turks by the Venetians, in the year 1685, after a very obstinate siege, which lasted 49 days. In 1715, it was retaken by the Turks, with little loss. Eighty miles S.S.W. of Corinth. N. lat. 37° . E. long. $21^{\circ} 55'$.

CORONA, in *Anatomy*, is that edge of the glans of the penis where the preputium begins.

CORONA, in *Architecture*, a broad flat member in a cornice, which is placed below the cymatium, and above the mutules or modillions. Thus the mutules or modillions, when there are any, support the corona. (See *Plate XIII. and XXIX. of Architecture.*) The corona is called by the Italians *gocciolatois* and *lagrimatois*; by the French, *larmier*; and by our workmen, *drip*: all words of the same import, and taken from the circumstance of the rain-water dropping from the corona, which thus shelters the members beneath.

The corona may be regarded as the most essential member of a cornice, as it is that part which answers the main purpose of giving shelter and producing shade; and except in a very few antique examples, such as the arch of Lions at Verona and the temple of Peace at Rome, where it is omitted, there is nothing in architecture better supported by authority and theory.

CORONA Borealis, or **Septentrionalis**, **Northern Crown**, or **Garland**, in *Astronomy*, a constellation of the northern hemisphere; whose stars in Ptolemy's Catalogue, in Tycho's and in Hevelius's, are 8; in the Britannic Catalogue, 21. See **CONSTELLATION**. See also Phil. Transf. for 1797, p. 315. 322.

CORONA Australis, or **Meridionalis**, **Southern Crown**, a constellation of the southern hemisphere, whose stars in Ptolemy's Catalogue are 13; in the British Catalogue, 12.

CORONA, **LEONARDO**, in *Biography*, an historical painter of eminence, was born in 1561. at Murano, in the state of Venice. After having received the scanty precepts which his father, a miniature painter, could furnish, he repaired to Venice, where his talent was first evinced in the admirable copies which he made from the pictures of Titian. He was soon employed in many extensive works, and became not unfrequently a successful competitor of the younger Palma. Tintoretto, however, seems to have been his model; and indeed, in his large picture of the Crucifixion, the resem-

blance to his prototype is so strong, that his biographers Ridolfi, has difficulty in defending him against the charge of plagiarism. Amongst his finest works may be enumerated a picture of the Annunciation, of striking effect, in the church of S. S. Gio, e Paolo; and an altar-piece, much in the style of Titian, in that of St. Stefano. This artist died in the year 1605. Ridolfi, Lanzi, Storia Pitt.

CORONA, in *Botany, a Crown, is by some writers used for the wing or down of the seeds of compound flowers, called by Linnæus *pappus*. It has been vaguely applied to the cup in the centre of a narcissus, by those who could affix no precise ideas to that part, and who would not adopt the Linnæan term *nectarium*. (See **COROLLA**.) Willdenow has first defined *Corona* as an appendage to the *nectarium*, consisting of one or more leaves, very various in form. In *Narcissus* it is, according to him, of one cup-like leaf; in some species of *Silene*, *Lycnis*, &c. of two leafy appendages to the claw of each petal. The latter appears to us almost the only case in which the term is wanted, and it is one of those words best used without any precise technical application. S.*

CORONA imperialis; Tourn. *Regalis*; Dill. See **FRI-TILLARIA regia**.

CORONA folis, lycnoidis folio; Plum. See **BUPHTHALMUM frutescens**.

CORONA folis, laureola folio; Plum. See **BUPHTHALMUM arborecens**.

CORONA folis, caroliniana; Mart. See **BUPHTHALMUM helianthoides**.

CORONA minor 3, and minor fenina; Taber. See **HELIANTHUS indicus et multiflorus**.

CORONA minor, disco atrorubente; Dill. See **HELIANTHUS atrorubens**.

CORONA maritima; Plum. See **SILPHIUM trilobatum**.

CORONA clericalis. See **CROWN**, and **COIF**.

CORONA Æthiopica, in *Natural History*, the name of a shell of the **DOLIUM**, or *concha globosa* kind.

CORONA imperialis, a name given by authors to a kind of voluta, differing from the other shells of that family, by having its head ornamented with a number of points, forming a sort of crown.

There are four species of this shell found in the cabinets of the curious.

CORONA folis Americana, the name of a marine insect. See **AMERICAN**, &c.

CORONA triumphalis, Lat. *triumphal crown*. Among the Romans, there were two triumphal crowns for the general, who had gained a signal or important victory: the first was given by the army, and originally it was only a simple laurel, but was afterwards of gold, in imitation of the leaves of the laurel; the second was called *corona provincialis*, which was likewise originally of simple laurel, but afterwards of gold, and very heavy. Plutarch informs us, that the person who triumphed received a great number of provincial crowns.

CORONA provincialis. See the preceding article.

CORONA, *Ital.* a crown, a musical character for a pause; is a semicircle with a point under it, thus; . it is often vulgarly called in English a bull's eye; see **CROWN** and **PAUSE**. The pause used to be *ad libitum*; but in full pieces this was found inconvenient, as the whole band never resumed the strain at the same instant. Emanuel Bach, and Haydn, we believe, were the first composers who ascertained its length by rests; making it consist of two or three bars, specified alike in all the several parts. The French term this kind of silence, *point d'orgue*. In rondeaux and songs in which *da capo* occurs, it is the final mark or signal of termination.

mination. It likewise indicates the final close in rounds and cadences upon such notes in the several parts, as form a common chord to the key notes.

CORONÆ, or HALOS, in *Optics*, are luminous circles which are sometimes seen round the sun, the moon, and even round the planets and the fixed stars. They are sometimes quite white, and at other times coloured: but for a full account of their different appearances, and for the various conjectures respecting the causes upon which they depend, see the article HALO.

CORONA *Lucida*, in *Astronomy*, a star of the first magnitude in *CORONA Borealis*. See LUCIDA, and CONSTELLATION.

CORONÆ *Jus*. See JUS, and *Right of the Crown*.

CORONÆ *plurimum custos*. See CUSTOS.

CORONÆA, in *Ancient Geography*, a town of Greece, in Phthiotis, a country of Thessaly, according to Strabo and Ptolemy.—Also, a place in Greece, in the Peloponneseus, situated between Sicyone and Corinth.—Also, a town situated in the northern part of the isle of Cyprus: it was episcopal; and called also Cyrenia and Cerunia.—Also, the name of a peninsula of Greece, placed by Steph. Byz. near Attica.

CORONAL SUTURE, in *Anatomy*, the suture which joins the semi-circular edge of the frontal bone to the anterior margin of the two parietal bones. See SKELETON.

CORONALE *Os*, a term which has been sometimes applied to the frontal bone.

CORONARIA, in *Botany*, Hort. Clif. See AGROSTEMMA *coronaria*.

CORONARIÆ, the ninth natural order in the *Systēma Naturæ* of Linnæus, and the tenth in the *Posthumous Prælectiones*. "A coronary flower," says Linnæus, "implies a beautiful one, which is inserted in crowns or garlands." Nothing can be more evident than that this is an accidental circumstance, which cannot be strictly defined, and which, in no point of view, has a right to constitute a natural order. In the *Systēma Naturæ*, the following six only are arranged under this order: ornithogalum, scilla, hyacinthus, asphodelus, anthericum, and polianthus. In the *Prælectiones*, the following are added, partly taken from the abolished orders, liliacæ and muricacæ: albuca; cyanella; lanaria, Ait.; *lachenalia*, Jacq.; *phormium*, Forst.; aletris; aloe; yucca; agave; bromelia; *hepeticis*, Swartz; tillandia; burmannia; hypoxis; hemerocallis; veratrum; melanthium; *curumbæca*, Thunb.; helonias; fritillaria; *euconis*, L'Herit.; lilium; tulipa. Those printed in Italics are inserted by Giseke. All the genera belong to the third class of Jussieu, which consists of monocotyledonous plants, with perigynous stamens; and are distributed by him among his orders, junci, lilia, bromeliæ, asphodeli, and narcissi. But Linnæus has admitted into his coronariæ only those plants which have no spathe, having formed his order spathacæ expressly for the others. In some of the coronariæ, he observes, the root is tuberous; in others, furnished either with a solid or with a scaly bulb. He connects aloe, yucca, &c. with lilium in this manner: the scaly bulb of lilium is nothing more than the permanent bases of the leaves (see BULB); but in the aloe, and plants allied to it, not only the base but the whole leaf is permanent, and is a kind of bulb out of the earth, the scales of which are dilated and fleshy. The stamens are six; the germ superior; and the capsule three-celled and three-valved.

CORONARY, in *Anatomy*, is a term applied to several parts of the body, and particularly to the blood-vessels which supply the heart.

CORONARY *Arteries of the Heart*, are two in number: an anterior and posterior, or right and left. See ARTERIES.

CORONARY *Ligament of the Liver*, is an adhesion of the posterior parts of this viscus to the tendinous centre of the diaphragm. See LIVER.

CORONARY *Arteries of the Lips*, are two branches (a superior and inferior) of the external maxillary artery. See ARTERIES.

CORONARY *Stomachic Artery*, or *arteria coronaria ventriculi*, is a branch of the celiac trunk, going to the stomach. See ARTERIES.

CORONARY *Vein of the Heart*, is the vessel which returns the blood from this viscus to the cavity of the right auricle. See VEINS.

CORONARY *Gold*, in *Ancient History*, a kind of free gift, which, under the Roman empire, consisted of occasional offerings, that retained the name and semblance of popular consent. It was an ancient custom that the allies of the republic, who ascribed their safety or deliverance to the success of the Roman arms; and even the cities of Italy, which admired the virtues of their victorious general, adorned the pomp of his triumph by their voluntary gifts of crowns of gold, which, after the ceremony, were consecrated in the temple of Jupiter, to remain a lasting monument of his glory to future ages. The progress of zeal and flattery soon multiplied the number, and increased the size of these popular donations; and the triumph of Cæsar was enriched with 2822 massy crowns, which might have amounted to 20,414 pounds of gold. This treasure was immediately melted down by the prudent dictator, who was satisfied that it would be more serviceable to his soldiers than to the gods: his example was imitated by his successors; and the custom was introduced, of exchanging those splendid ornaments for the more acceptable presents of the current gold coin of the empire. The Tarragonese Spain presented the emperor Claudius with a crown of gold of seven, and Gaul with another of nine, hundred pounds weight. The spontaneous offering was at length exacted as the debt of duty; and instead of being confined to the occasion of a triumph, it was supposed to be granted by the several cities and provinces of the monarchy, as often as the emperor condescended to announce his accession, his consulship, the birth of a son, the creation of a Cæsar, a victory over the Barbarians, or any other real or imaginary event which graced the annals of his reign. The peculiar free gift of the senate of Rome was fixed by custom at sixteen hundred pounds of gold, or about 64,000*l.* sterling. The oppressed subjects celebrated their own felicity, that their sovereign should graciously consent to accept their feeble but voluntary testimony of their loyalty and gratitude. The senators were supposed to be exempt from the "Aurum Coronarium;" but the "Auri Oblatio," which was required at their hands, was precisely of the same nature.

CORONATION. See CROWN, KING, and OATH.

CORONATION *of the Pope*, a ceremony described by l'Évêque, in his "History of the Council of Constance," in his account of the coronation of Martin V., created pope in a peculiar manner, agreed by that council, in the room of John XXIII., whom they had deposed. On this occasion there was erected in the court of the palace, a grand theatre, capable of containing 100 persons. "Close to the wall was a very high throne, above which there was a canopy of cloth of gold, the seat destined for his holiness. On the right hand, and on the left, were ranged several other seats, a little lower, but magnificent, for the princes and the prelates to sit on. At eight o'clock in the morning, the two patriarchs, (for since the time of the crusades, they had got titular Latin patriarchs in the eastern patriarchal sees sub-

duced

duced by the Mahometans) the twenty-two cardinals, (for there were no more then present) the archbishops, the bishops, the mitred abbots, entered the court of the palace, on horseback, in pontifical habits. The emperor, and the other princes, followed on foot. When all the people were assembled, the pope mounted the theatre, preceded by the clergy, carrying the cross and waxen tapers. On the forepart of the theatre there was an excellent choir of music, which sang and played on all sorts of instruments. The pope had on his head a superb tiara, seeded with gold crowns, with a golden cross on the top. At his right hand, a little behind, were cardinal Viviers, and a patriarch; at his left, cardinal Brancas, with another patriarch. Then marched the other cardinals, and the grand master of Rhodes, who were all received by the emperor, the electors, and the princes. The pope being placed on the throne, the patriarch of Antioch took his tiara, or crown, off his head, and knelt before him, holding his crown in his hand. Near him other cardinals knelt also; one of whom carried some tow at the end of a stick, another a cross, and the rest wax tapers. At the pope's right hand sat cardinal de Brancas, with eight other cardinals; at his left, the grand master of Rhodes, with eight cardinals. Next them, on the right, the emperor, on the left, the elector of Brandenburg, both attended by archbishops. Next them, electors, princes, bishops, and other prelates, as many as the place could contain. The rest sat on the stairs, which had been made very wide for the purpose. There was, beside these, in the court, a great number of archbishops, bishops, and other great lords, both ecclesiastic and secular, who surrounded the theatre on horseback. There was, likewise, an immense crowd of people, who could not get into the court. When the music had ceased, one of the cardinals, who was kneeling before the pope, and who carried the tow, lighted it, and twice said aloud, addressing himself to the pope, "Sancte pater, sic transit gloria mundi." After which, three cardinals, who had been selected for putting the crown on the pope's head, standing up with the grand master of Rhodes, and taking the crown from the hands of the pope, they all four knelt on the highest step of the throne, whence, after saying a prayer, they arose, and put the crown on the pope's head: after which, resuming their former places, they heard the *Te Deum*, and the music. When they left the place, the pope mounted his white horse, which was preceded by three led horses, that were also white, and had red caparisons. The inferior clergy walked before, followed by the abbots, bishops, archbishops, and cardinals, on horseback. The emperor, on foot, held the reins of the pope's bridle on the right, walking in the dirt, (which is particularly observed by the historian) whilst the elector of Brandenburg did the same on the left. Thus the pope was carried in procession from the cathedral to the Augustin monastery, and thence reconducted to the episcopal palace. Here ended the ceremony."

CORONATORE ELIGENDO, in *Law*, a writ at common law, which, after the death or discharge of any coroner, is directed to the sheriff, out of the chancery, to call together the freeholders of the county, for the choice of a new coroner, to certify into chancery both the election, and the name of the party elected, and to give him his oath, &c. F. N. B. 163.

CORONATORE esonerando, is a writ for the discharge of a coroner, for negligence or insufficiency in the execution of his duty: and where coroners are so far engaged in any other public business, that they cannot attend the office;

or if they are disabled by old age, or disease, to execute it; or have not sufficient lands, &c. they may be discharged by this writ. See **CORONER**.

CORONE, **CORON**, in *Ancient Geography*, a town of the Peloponnesus, on the gulf of Messina, according to Pausanias; it was otherwise called *Cepeia*; but after the re-establishment of the Messenians, Epimelides, the chief of a colony, which they had brought thither, called it *Corone*, after the name of his native town in *Bœotia*. This town had many temples, among which were those of Diana, Bacchus, and *Æsculapius*. Each deity had a marble statue. The public place was ornamented with a bronze statue of Jupiter Salvator. In the citadel was a Minerva, holding in her hand a crown. The harbour of this city was called the "port of the Achæans." The territory of *Corone* extended as far as *Colonis*; and at the distance of 80 stadia from the city, on the sea coast, was a temple of Apollo, very ancient and the most celebrated of the country. Pliny says that from this city the gulf in which it was situated was called "Sinus Coronæus." See **CORON**.

CORONE, in *Ornithology*, a species of *CORVUS*, which see.

CORONEA, *Koronuz*, in *Ancient Geography*, a town which subsisted for a long time in *Bœotia*, as it is mentioned by Plutarch, Cornelius Nepos, Diodorus, Strabo, and Pausanias. It was situated on an eminence, near mount Helicon, at some distance to the south of *Cheronæa*, and not far to the south-west of the temple of *Minerva Itonia*, in which the estates of *Bœotia* were accustomed to assemble. In the public place of this city was an altar of Mercury Epimelius, another consecrated to Venus, and at a small distance a temple of Juno, in which was a very ancient statue, executed by Pythodorus of Thebes. This town was episcopal; but it is now only a village.

CORONEL PAUL, in *Biography*, a native of Spain, and distinguished by his great proficiency in the Oriental tongues. He was professor of theology at the university of Salamanca, and was employed by cardinal Ximenes in publishing his edition of the Polyglot bible. He died A.D. 1524. Moreri.

CORONELLA, in *Zoology*, a species of coluber, the *COLUBER Petbola*; which see.

CORONELLI, **VINCENT**, in *Biography*, a native of Venice, to which city in 1685 he was appointed cosmographer. He afterwards was public professor of geography. His works are numerous, and it is said he composed with so much facility that the writing of a folio was to him less labour than that of a pamphlet to another man. He began "An Universal Library," which he meant to extend to 40 volumes folio, but seven only appeared. He published 400 maps with explanations, and in 1683 he completed two globes very nearly 12 feet in diameter, curiously ornamented with emblems, inscriptions, &c. which were placed in the royal library in Paris, and of which M. de la Hire published a description in the year 1704. Moreri.

CORONER, a very ancient officer at common law in this kingdom, so called, because he hath principally to do with the pleas of the crown; or such in which the king is more immediately concerned. In this view of the office the lord chief justice of the king's bench is the principal coroner in the kingdom, and may, if he pleases, exercise the jurisdiction of a coroner in any part of the realm. (4 Rep. 57.) But there are particular coroners for every county of England; they are usually four, sometimes six, and sometimes fewer, in each county. (F. N. B. 163.)

CORONER.

This officer is of equal antiquity with the sheriff, and was ordained together with him to keep the peace when the earls gave up the wardship of the county. Mention is made of this officer as early as the time of king Athelstan, anno 925.

Indeed the office of the coroners in England is so ancient, that the commencement of it is lost in obscurity. "It seems (says Mr. Millar, in his "Historical View of the English Government,") to have been an immemorial custom of the Anglo-Saxons, that several persons of distinction should be named by the freeholders in each county, with power to secure and imprison criminals of all sorts, to the end that they might be brought to a trial. From this employment, these officers, as in after-times the justices of the peace, found the means of assuming a criminal jurisdiction, which gradually became more extensive. Another branch of business, devolved upon the coroner, and which may be regarded as an appendage or consequence of the former, was that of ascertaining and determining the value of the fines, amerciaments, and forfeitures, or of any other emoluments, which occurred to the sovereign, either from the condemnation of public offenders, or from the right of the crown to all the goods, of which no other proprietor could be found. When the coroner had occasion to inquire into the truth of any fact, either with a view to determine those matters which fell under his own jurisdiction, or in order to transmit an account of it to some other criminal court, he proceeded, in the same manner that was customary in the courts of the hundred, and of the county, by the assistance of an inquest or jury; and the number of jurymen, who, in those cases, were called from the neighbouring townships, was not less than was employed in other judicial investigations.

"After the Norman conquest, when the *aula regis* drew to itself the cognizance of the greater part of crimes, it became the duty of the coroner to certify to that court his inquisition concerning those offences which fell under its jurisdiction; and upon this information, the most authentic that could well be procured, a trial before the grand judiciary was commenced. Upon the establishment of the king's bench, and of the commissions of oyer and terminer and gaol delivery, the like certification, and for the same purpose, was made by the coroner to these tribunals.

"But in proportion to the advancement of the prerogative, the authority of the coroner, an officer elected by the county, was diminished; his jurisdiction was daily subjected to greater limitations; and his reports became gradually more narrow and defective: whether it be that, by having a fellow-feeing with the inhabitants, he endeavoured to screen them from justice, or that, from the rust and relaxation to which every old institution is liable, his operations became tardy and inaccurate; certain it is, that he came to overlook the greater part of the offences which require the interposition of the magistrate, and his inquisition was at length confined to a few of those enormous crimes, which excite universal indignation and resentment.

"To supply the deficiency of the coroner's inquest, the sheriff, who had come, in a great measure, under the appointment of the crown, was directed, upon the meeting of judges in the circuits, or of the other criminal courts, to call a jury, in order to procure information concerning the crimes committed in particular districts. Hence the origin of what is called the grand jury, by whose inquisition the judges were authorized to proceed in the trial of public offenders.

"The employment of the coroner in Scotland, was the

same as in England: and he appears to have used the same forms in the exercise of his jurisdiction. With the assistance of a jury, he enquired into the commission of crimes; and either punished them by his own authority, or transmitted information concerning them to the competent court. The negligence of this officer seems, in that country, to have likewise produced the interposition of the sheriff, or chief magistrate of particular districts, by calling a jury for the same purpose."

The coroners are chosen by the freeholders of the county, by virtue of a writ out of chancery; and the choice is for life, unless they become sheriffs or verderors, or are discharged by the writ *de coronatore exonerando*, or by stat. 25 Geo. II. cap. 23, for extortion, neglect, or misbehaviour.

This officer, by the statute of Westminster, (3 Edw. I. c. 10) ought to be a knight; and there is a writ in the register, now obsolete, called *nisi sit miles*, whereby it appears to be a sufficient cause for removal of a coroner chosen, if he were not a knight and had a hundred shillings *per ann.* freehold. This qualification, however, is now disregarded; and persons are chosen into this office merely for the sake of the fees annexed to it by 3 Hen. VII. cap. 1. and 25 Geo. II. cap. 29.

The coroner is to take the oaths of allegiance, supremacy, and abjuration, and then the oaths of office; and when he is elected and sworn into his office, he is to remember the qualification-acts, and, in due time, to take the sacrament and oaths of abjuration. Imprey's Sheriff. By the stat. 25 Geo. II. c. 29. above cited, for every inquisition, not taken upon the view of a body dying in gaol, which shall be taken by any coroner in any township or place contributing to the rates directed by stat. 12 Geo. II. c. 29., the sum of 20s. and for every mile which he shall travel from the place of his abode, the further sum of 9d. shall be paid him out of the money arising from the said rates; but for every inquisition taken upon the view of a body dying in gaol, so much money not exceeding 20s. shall be paid him as the justices at sessions shall think fit to allow, out of the money arising from the said rates. Provided that over and above the recompence by the statute appointed, the coroner who shall take an inquisition upon the view of a body slain or murdered, shall have the fee of 13s. 4d. payable by stat. 3 Hen. VII. c. 1. out of the goods of the slayer or murderer, or out of the amerciaments upon the township if the slayer or murderer escape. Coroners taking farther fees are guilty of extortion. The stat. 1 Hen. VIII. c. 7. enacts, that where a person is slain by misadventure, the coroner is to take no fee, on pain of 40s.

Their authority is judicial and ministerial; judicial, ascertained in great measure by stat. Edw. I. "de officio coronatoris," and consisting, first, in inquiring, when a person is slain, or dies suddenly, or in prison, concerning the manner of his death. And this must be "super visum corporis;" (4 Inst. 271); for if the body be not found, the coroner cannot sit. He must also sit at the very place where the death happened; and his inquiry is made by a jury from 4, 5, or 6 of the neighbouring towns, over whom he is to preside. If any be found guilty by this inquest of murder or other homicide, he is to commit them to prison for further trial, and he is also to inquire concerning their lands, goods, and chattels, which are forfeited thereby: but, whether it be homicide or not, he must inquire whether any deadland has accrued to the king, or the lord of the franchise, by this death; and he must certify the whole of this inquisition (under his own seal and the seals of the jurors) together with the evidence thereon, to the court of King's Bench, or the next assizes. Another branch of his office

is to inquire concerning shipwrecks; and certify whether wrecks or not, and who is in possession of the goods. Concerning treasure-trove, he is also to inquire who were the finders, and where it is; and whether any one be suspected of having found and concealed a treasure: "and that may be well perceived (saith an old statute of Edward I.) when one liveth riotously, haunting taverns, and hath done so of long time?" whereupon he might be attached, and held to bail, upon this suspicion only. The ministerial office of the coroner is only as the sheriff's substitute. For when just exception can be taken to the sheriff, for suspicion of partiality, (as that he is interested in the suit, or of kindred to either plaintiff or defendant,) the process must then be awarded to the coroner, instead of the sheriff, for the execution of the king's writs. (4 Inst. 271.) In their former capacity the act of one has the same force as if they had all joined; in the latter, their acts are void, unless they join. 4 Inst. 271. 1 Plowd. 73. And the authority of coroners does not determine by the demise of the king; as that of judges, &c. doth, who act by the king's commission. 2 Inst. 174.

If the coroner be remiss in coming to perform his office, when he is sent for, &c. he shall be amerced by virtue of the statute "De Coronatoribus." Coroners, concealing felonies, &c. are to be fined and suffer one year's imprisonment. 3 Ed. I. c. 9.

There are also certain *special coroners* within divers liberties, as well as the ordinary officers in every county; and some colleges and corporations are empowered by their charters, to appoint the coroner within their own precincts. (4 Inst. 271.) The bishop of Ely also hath power to make coroners by a charter of Henry VII.; and there are coroners of particular lords of franchises and liberties, who, by charter, have power to create their own coroners, or to be coroners themselves; especially the jurisdiction of the admiralty, as well as that of the verge. The coroner of Portsmouth hath jurisdiction on board a man of war in Portsmouth harbour; for though the admiralty has a coroner of its own, he never takes inquisition of *felonia*.

CORONER of the king's household, hath exempt jurisdiction within the verge and the coroner of the county cannot intermeddle within it; as the coroner of the king's house may not intermeddle in the county, out of the verge. (2 Hawk. P. C. c. 9. § 15.) If an inquisition be found before the coroner of the county, and the coroner of the verge, where the homicide was committed in the county, and so it is entered and certified, it will be error. (4 Rep. 45.) But if a murder be committed within the verge, and the king removes before any indictment be taken by the coroner of the king's household; the coroner of the county, and the coroner of the king's house, shall enquire of the same: and according to sir Edward Coke, the coroner of the county might enquire thereof at the common law. (2 Hawk. P. C. c. 9. § 15. 2. Inst. 550.) If the same person be coroner of the county, and also of the king's house, an indictment of death taken before him as coroner, both of the king's house, and of the county, is good. 4 Rep. 46. 2 Inst. 134. See stat. 33 Hen. VIII. 12. Parl. 1 & 3.

CORONER of London, is eligible by the charter of King Edward IV. by the mayor and commonalty of the city, and no other coroner has any power there. The lord mayor of London is by charter, 18 Edward IV., coroner of London: Also the lord mayor, &c. may chuse two coroners in Southwark. When any one is killed, or comes to an untimely death in London, the coroner upon notice shall attend where the body is, and forthwith cause the beadles of the ward to summon a jury to make the necessary inquiry, how

such person came by his death; and after inquisition taken, he shall give a certificate to the churchwarden, clerk, or sexton of the parish, to the intent the corpse may be buried: the coroner's fee in this case formerly amounted to 25s. but now to about double that sum; unless the friends of the deceased are poor, and then he shall execute his office for nothing. The coroners in London and Middlesex, and in other cities, may bail felons and prisoners, according to former custom. Stat. 1 & 2 P. & M. c. 13. § 6. 1 I. l. Abr. 327.

CORONER, *court of*. See COURT.

CORONET, in *Furriery*. See CORNET.

CORONET, in *Heraldry*. See CROWN, DUKES, EARLS, &c.

CORONIL, in *Geography*, a town of Spain, in the province of Andalusia; 30 miles S. of Seville.

CORONILLA, in *Botany*, (a little crown, so called from the flowers crowning the branches in a corymb.) Linn. gen. 883. Schreb. 1198. Willd. 1367. Gært. 891. Juss. 361. Vent. 3. 422. Class and order, *diadelphia decandria*. Nat. Ord. *Papilionacea*, Linn. *Leguminosae*, Juss.

Gen. Ch. *Cal.* one-leafed, very short, campanulate, five-toothed; the two upper teeth near together, the three lower smaller; permanent. *Cor.* papilionaceous; standard somewhat heart-shaped, reflexed on all sides, scarcely longer than the wings; wings egg-shaped, obtuse, connivent near the top, dehiscent towards the bottom; keel compressed, acuminate, ascending, often shorter than the wings. *Stam.* Filaments diadelphous, nine and one, ascending, broader at the top; anthers simple, small. *Pist.* Germ. superior, cylindrical; style brittle-shaped, ascending; stigma small, obtuse. *Peric.* Legume long, generally cylindrical, jointed, contracted more or less between each joint, often separating at the joints. *Seeds* one in each joint.

Ess. Ch. Calyx two lipped; upper lip with two connate teeth, lower with three; standard scarcely longer than the wings. Legume contracted between the seeds.

Linnaeus has included in this genus the coronilla, securidaca, and emerus of Tournefort. Justieu thinks that some of the Linnæan species should be placed under the ornithopus, and that Tournefort's genera should be restored. Mr. Salisbury (Parad. Lond. 13.) is decidedly of opinion, that they are very distinct. In *coronilla*, the legume is cylindrical and apparently jointed; and the seeds rather oblong. In *securidaca*, the legume is compressed, with one suture flat, the other narrow; the seeds tetragonous. In *emerus*, the claws of the petals longer than the calyx; the legume narrow and awl-shaped; the seeds cylindrical.

Sp. 1. *C. emerus*. Linn Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 9. Bot. Mag. 445. (*Colutea siliquosa* five *scorpioides* major; Baub. Pin. 397. *Colutea scorpioides* 1. elatior; Clus. hist. 97. *Emerus Cæsalpini*; Tourn. 650. Duham. arb. 1. 215. tab. 90. Mill Pl. 132. fig. 1.) β *Colutea scorpioides* minor; Baub. Pin. 397. *Colutea scorpioides* 1 humilior; Clus. hist. 97. *Emerus minor*; Tourn. Pl. 132. fig. 2. Scorpion tenna of the English gardeners. "Shrubby; peduncles about three-flowered; claws of the petals three times longer than the calyx; stem angular." A much branched, spreading, bushy shrub, from two to six, and in gardens eight or nine feet high. *Stem* not very straight, sometimes so weak as to need support. *Leaves* alternate; leaflets seven or nine, inclining to inversely heart-shaped, green above, somewhat glaucous underneath, smooth. *Flowers* entirely yellow, or tinged with orange-red, about three together on common axillary peduncles; pedicels shorter than the calyx; calyx broad, four-toothed; standard very remote from the other petals. *Legume* slender, with scarcely apparent joints. *Seeds* cylindrical. A native of France

CORONILLA.

France and Germany; common in the English gardens, flowering in May and June, and sometimes again in autumn. Neatly trained to a wall or paling, it makes a beautiful appearance in flower; for which purpose it is well fitted by the shortness of its shoots. The leaves properly fermented are said to produce a dye, nearly equal to that of indigo.

2. *C. juncea*. Linn. Sp. Pl. 2. Mart. 2. Lam. 5. Willd. 10. (*Polygala major massiliotica*; Bauh. Pin. 349. *Colutea caule gemitæ fungoso*; Bah. hist. 1. p. 383. *Dorichnium luteum*; Barr. ic. 133.) "Shrubby; leaves quinate and ternate, linear-lanceolate, somewhat fleshy, obtuse." *Stems* about two feet high, erect; branches quite erect, slender, filiform, almost naked, or with very few leaves, green. *Leaves* small, in distant pairs; the lowest pair remote from the stem. *Flowers* yellow, six or seven together in small peduncled terminal umbels. *Legumes* slender, jointed, slightly compressed, with small wings at the edges. A native of Spain and the South of France, flowering the greater part of the summer. 3. *C. glauca*. Linn. Sp. Pl. 4. Mart. 4. Lam. 2. Willd. 12. Bot. Mag. 13. (*Colutea scorpioides maritima glauco folio*; Bauh. Pin. 397. *Coronilla maritima*; Tourn. Juss. 650.) "Shrubby; leaflets seven, very obtuse, mucronate; lower ones distant from the stem; stipules lanceolate." *Stem* about three feet high; branches numerous, green or reddish, more or less bent at each joint. *Leaflets* ridge-shaped, sometimes inversely heart-shaped, somewhat fleshy, with a small reflexed point, glaucous; stipules very small. *Flowers* yellow, ten or twelve in an umbel, on common peduncles longer than the leaves, remarkably fragrant in the day, almost scentless during the night. A native of the South coast of France. A constant ornament to our green houses, and almost perpetually in blossom. 4. *C. valentina*. Linn. Sp. Pl. 3. Mart. 3. Willd. 11. Mill. Pl. 289. fig. 1. Bot. Mag. 185. Gært. tab. 155. fig. 1. (*C. stipularis*. Lam. 4. *C. hispanica* Mill. Mart. 13?) "Shrubby; leaflets nine or eleven, very glaucous, smooth; lower ones rather remote from the stem; upper stipules larger, roundish, mucronate." *Stem* a foot and half or two feet high, erect, smooth branches alternate, glaucous, zig-zag. *Leaves* alternate, shorter than the common peduncles; leaflets smaller than those of the preceding species, more truly glaucous, somewhat wedge-shaped, retuse, with or without a small joint; stipules deciduous as the plant comes into flower. *Flowers* deep yellow, powerfully scented by day and by night. *Legume* long, erect; joints from three to seven, elliptical, turgidly lenticular, valveless. *Seeds* ovate-oblong, slightly compressed, of a red ferruginous colour. A native of Spain and Italy. A hardy green-house plant, flowering in May, June, and July. 5. *C. coronata*. Linn. Sp. Pl. 5. Mart. 5. Lam. 3. Willd. 14. Jacq. Aust. 1. tab. 95. Lam. Ill. Pl. 630. fig. 4. Bot. Mag. 907. (*C. montana*; Scop. Carn. 912. tab. 44. *Colutea siliquosa minor coronata*; Bauh. Pin. 397. *C. scorpioides altera*; Clas. hist. 1. 98.) "Somewhat shrubby; leaflets nine, elliptical; lower ones almost close to the stem; stipule opposite the leaf, two-parted; legumes pendulous." A shrub about a foot and half high, woody at the bottom, but dying down to the ground every year. *Stems* erect, smooth, greenish, but little branched. *Leaves* alternate; leaflets smooth, glaucous; stipules small, embracing the stem, shrivelling, falling off very early. *Flowers* yellow, with a greenish tint at the end of the petals, especially of the keel; peduncles erect, longer than the leaves, rising from the upper axils, and bearing about twenty flowers; claws of the petals a little longer than the calyx. *Legumes* with three or four joints, somewhat angular. A native of the South of Eu-

rope. 6. *C. viminalis*. Salis. Par. Lond. 13. "Stem scarcely angular; leaflets from seven to eleven, more or less inversely egg-shaped, retuse, mucronate, glaucous; peduncles from six to ten-flowered; legumes very long; bowed upwards." Gathered near Mogadore by Broussonet, and raised in England from seeds sent to Mr. Salisbory by that botanist. Cuttings from it readily take root, and it ripens its seeds in our green-houses every year. 7. *C. squamata*. Willd. 13. Cavan. 1. 43. tab. 153. "Herbaceous; leaflets eleven, inversely egg shaped, somewhat tomentous; stipules lanceolate; legumes beset with scurfy scales, pendulous." A native of Spain. 8. *C. minima* Sp. Pl. 7. Mart. 6. Lam. 6. Willd. 15. Jacq. Aust. 3. tab. 271. Tourn. 650. (*Ferrum equinum*, siliquis in summitate; Bauh. Pin. 349. *Polygalon Cortusi*; J. Bauh. hist. 2. 351. *Lotus enneaphyllos*; Dalech. hist. 510.) "Somewhat shrubby, procumbent; leaflets nine, egg-shaped; stipule opposite the leaf, emarginate; legumes angular, knotty." β *C. five colutea minima*; Tourn. 650. Lob. ic. 87. (*Polygala altera*; Bauh. Pin. 344. *Polygala valentina*; Clus. 1. 98. *Colutea, parva species*; J. Bauh. 1. 383.) "The same with more erect and more shrubby stems." *Stems* several, woody, two or three inches long, prostrate; branches herbaceous, annual, pale-green, prostrate and extending five or six inches. *Leaflets* very small, obtuse with a small point, of a fine glaucous colour; the two lower ones close to the stem; stipules very small, often deciduous. *Flowers* yellow, with a greenish tint at the ends of the petals, eight or ten together on a common peduncle, longer than the leaves. *Legumes* pendulous, slightly angular, with three or four oval-oblong joints. A native of the south of Europe, on dry uncultivated hills. 9. *C. pentaphylla*. Willd. 16. Desfont. atl. 2. 170. "Shrubby; leaflets generally five, wedge-shaped, emarginate; stipules egg-shaped." A very smooth shrub, two or three feet high, erect, much branched. *Stipules* large, deciduous. *Flowers* yellow, from ten to twenty in an umbel. A native of hills about Algiers. 10. *C. argentea*. Linn. Sp. Pl. 6. Mart. 7. "Shrubby; leaflets eleven, silky; the outer one larger." La Marck thinks it very dubious what plant Linnaeus intended, and has referred to his stipularis the synonym from Alpinus, the only one quoted in the Species Plantarum. The stipularis is, we think, beyond a doubt the *C. valentina* of Linnaeus and the Botanical Magazine. Mr. Miller has a *C. argentea* which seems to be distinct. He has figured it in Pl. 106, with the following description. A very humble shrub, rarely more than two feet high, and in a dry barren situation not more than one. *Stem* hard and woody, producing branches on every side near the ground. *Leaves* produced at the joints; stipules two, ear-shaped. *Flowers* yellow, very sweet-scented, on long slender axillary common peduncles. A native of the island of Crete, flowering in May, and ripening its seeds in August and September. It has a silky appearance only when it grows in a poor soil. 11. *C. cappadocica*. Willd. 18. (*C. orientalis*; Mill. Mart. 14. *C. orientalis herbacea, flore magis luteo*; Tourn. cor. 44.) "Herbaceous; leaflets nine, inversely heart-shaped; stipules roundish, wedge-shaped." *Leaflets* glaucous underneath; stipules smaller than those of *C. valentina*, retuse, permanent. *Flowers* yellow, numerous, on strong peduncles upwards of six inches in length. *Legumes* short, thick, about an inch long. A native of Cappadocia. 12. *C. vaginalis*. Lam. 7. Willd. 19. (*Polygala montana italica, flore aureo*; Barrel. ic. 721?) "Somewhat shrubby, very small; leaflets about eleven, inversely egg-shaped; lower ones remote from the stem; stipules opposite to the leaves, solitary, emarginate, sheathing." *Flowers* yellow, from five to eight in a terminal umbel; claws of the petals longer than the calyx.

C O R O N I L L A.

lyx. Observed by Vahl in Italy, and communicated to him by La Marck. 13. *C. securidaca*. Linn. Sp. Pl. 8. Mart. 8. Lam. 9. Willd. 20. (*Securidaca lutea* major; Bauh. Pin. 348. Tourn. Inst. 399. *S. vera*; Clus. Hist. 2. 236. *S. legitima*; Gært. tab. 153. fig. 3. *Hedysarum* five *S. major*. Job. ic. 2. p. 76.) Hatchet vetch. "Herbaceous; leaflets numerous, oblong, wedge-shaped; legumes compressed, sword-shaped." *Root* annual. *Stems* about a foot long, procumbent, striated, hollow. *Leaflets* fifteen or seventeen, green, smooth, obtuse. *Flowers* yellow, from eight to twelve in an umbel; common peduncles axillary, striated, hispid towards the base. *Legume* near four inches long, compressed, a little bent like a sickle, but shaped like a broad sword, terminated by the short stigma, pubescent in the middle, and a little swollen by the seeds, smooth at the sides with a broad margin, many-celled, two-valved; partitions membranous, very thin, permanent; the seed-bearing suture deeply furrowed. *Seeds* about twelve, oblong, quadrangular, compressed, smooth, ferruginous-red. It sleeps with the leaflets, converging above the petiole, and bent towards its base. A native of Spain, flowering in July. 14. *C. varia*. Linn. Sp. Pl. 9. Mart. 9. Lam. 8. Willd. 21. Bot. Mag. 258. (*C. herbacea*, flore vario; Tourn. 650. Riv. tetr. tab. 94. *Hedysarum purpureum*; Tabern. 516. *Securidaca dumetorum* major; Bauh. Pin. 349. *S. 2. altera*; Clus; 2. 237.) "Herbaceous; leaflets numerous, lanceolate, smooth; legumes cylindrical, erect." *Root* annual: Linn. Lam. Willd. perennial; Mill. *Stems* climbing, if supported, to the height of four or five feet, otherwise trailing on the ground. *Leaves* a little resembling those of faintfoin; leaflets from seventeen to twenty-one, rather obtuse; lower pair close to the stem; stipules small, lanceolate, spreading. *Flowers* about twelve in an umbel, either entirely purple, or entirely white, or with the standard purple and the wings white; common peduncles axillary, about the length of the leaves. *Legumes* slender, from two to three inches long. A native of Germany, France, and other parts of Europe. It has been recommended as a proper food for cattle, and cows are said to eat it readily. 15. *C. globosa*. Lam. 11. Willd. 22. (*C. cretica herbacea*, flore magno, candido; Tourn. Cor. 44. *Hedysarum argenteum*; Alp. exot. 314.) "Herbaceous; leaflets numerous, elliptical; umbels globular; legumes cylindrical, pendulous." *Stems* striated, smooth, branched. *Leaflets* eleven or thirteen, obtuse, smooth, larger than those of the preceding species; stipules small, egg-shaped, acute. *Flowers* white, large, from twenty to thirty in a dense umbel, on common axillary peduncles. *Legumes* slender, smooth. A native of Crete. 16. *C. cretica*. Linn. Sp. Pl. 10. Mart. 10. Lam. 10. Willd. 24. Jacq. Hort. tab. 25. (*C. cretica flore parvo purpurascens*; Tourn. Cor. 44.) "Herbaceous; leaflets fifteen, wedge-shaped, retuse; legumes about five together, cylindrical, erect." *Root* annual. *Stems* ascending, slender, angular, about a foot long. *Leaflets* smooth, the terminal one not larger than the others; stipules small, linear or lanceolate, spreading. *Flowers* purple, small; common peduncles axillary, hispid towards the base. *Legumes* slender, cylindrical, slightly jointed, a little curved, especially towards the summit. A native of Crete. 17. *C. parviflora*. Willd. 24. (*C. cretica, flore luteo parvo*; Tourn. Cor. 44.) "Herbaceous; leaflets nine, wedge-shaped, emarginate; legumes about five together, cylindrical, bowed; stem hispid." *Root* perennial. *Stem* six inches high, much branched, covered with small, rigid, reflexed, scattered hairs. *Leaves* smooth; stipules very small. *Flowers* yellow, small. *Legumes* filiform, spreading. A native of Crete. 18. *C. scandens*. Linn. Sp. Pl. 11. Mart. 11. Lam. 12. Willd. 25.

Plum. MSS. Burm. Amer. 98. tab. 107. fig. 7. "Stem climbing, flaccid." *Stem* slender, hairy, twilling about neighbouring plants, and rising to the height of eight or ten feet. *Leaves* alternate; leaflets five, an inch long, elliptical, tender; stipules in pairs, acute. *Flowers* pale yellow, large; peduncles axillary, in pairs, one-flowered, beset in all their length with small acute bractes. *Legumes* more than three inches long, taper, erect, clothed with a short, soft, white down. A native of Guiana, Carthage, and Martinico. 19. *C. cochinchinensis*. Mart. 12. Lour. Cochinch. 452. "Somewhat shrubby; leaflets about fifteen; peduncles about three-flowered; legumes erect, swollen with the seeds." *Stem* four feet high, erect, branched. *Leaflets* oblong, obtuse, with a slender point. *Flowers* yellow, axillary. *Legumes* filiform. *Seeds* nearly cylindrical. A native of Cochinchina.

To these more generally acknowledged species of coronilla, which, with one or two exceptions, have their flowers in simple umbels, Willdenow has a separate section of plants with flowers in racemes, chiefly taken from the *Æschynomene* of Linnæus and other authors. As none of these are particularly described, and some not inserted in our article *ÆSCHYNOMENE*, we shall subjoin them here.

20. *C. grandiflora*. Willd. 1. (*Æschynomene*. Linn. Sp. Pl. Setban affinis; Brey. prod. 1. 47. Comm. mal. 244. *Galega affinis malabarica*; Rai. Hist. 1734. Turia; Rumph. amb. 1. 188. tab. 76. *Agaty*; Rheed. mal. 1. 95. tab. 51. *Dolichos arboreus*; Forsk. desc. 134.) "Racemes about three-flowered; leaflets oblong, emarginate, smooth; legumes filiform, erect, compressed; stem arboreous." From ten to fifteen feet high. *Trunk* erect; branches somewhat spreading, cylindrical, pubescent. *Leaves* a foot long, alternate; petioles thicker, at the base smooth; leaflets very numerous, smooth, on very short petioles. *Flowers* very large, the size of a hen's egg, white, pinnulous, peduncles axillary, short, bifid or trifid; pedicels one-flowered. *Legumes* two-feet long, linear, compressed. A native of the East Indies. 21. *C. coccinea*. Willd. 2. (*Æschynomene*; Linn. jun. Supp. 330. Forsk. Prod. 273. *Toeri-mera*; Rumph. Amb. 1. 190. tab. 77.) "Racemes about three-flowered; leaves oblong, emarginate, pulverulent; legumes somewhat bowed, filiform, a little compressed; stem arboreous." A smaller and lower tree than the preceding. *Leaves* about a foot long; leaflets very numerous. *Flowers* large, red, mixed with purple. *Legumes* a foot and half long. A native of the East Indies, and of the islands Otaheite and Huahaine, in the South Seas. 22. *C. occidentalis*. Willd. 3. (*Emerus*; Plum. Spec. 19. ic. 125. fig. 1.) "Racemes few-flowered; leaflets elliptical; legumes cylindrical, filiform; stem shrubby." 23. *C. setban*. Willd. 4. (*Æschynomene*; Linn. Sp. Pl. Setbau; Alpin. ægypt. 81. tab. 82. *Galega ægyptiaca*, filiquis articulatis; Bauh. Pin. 352. *Dolichos*; Forsk. desc. 134.) "Racemes many-flowered; leaflets linear, obtuse, mucronate; rachis smooth and even; legumes filiform, cylindrical; stem shrubby." *Flowers* small, deep yellow, in long, axillary, pendulous racemes. *Legumes* smooth, taper-pointed, not apparently jointed. A native of Egypt. 24. *C. aculeata*. Willd. 5. (*Æschynomene bispinosa*; Jacq. ic. rar. 3. tab. 564.) "Racemes few-flowered; leaflets linear, obtuse, mucronate; rachis prickly; legumes filiform, cylindrical; stem herbaceous." *Root* annual. 25. *C. cannabina*. Willd. 6. (*Æschynomene*; Retz. obs. 5. p. 26.) "Peduncles solitary or in pairs, one-flowered; leaflets linear, obtuse, mucronate; rachis smooth and even; legumes compressed, tetragonous." *Root* annual. A native of the East Indies. 26. *C. piña*. Willd. 7. (*Æschynomene*;
Cavan.

Cavan. ic. 4. 7. tab. 314.) "Racemes many-flowered, pendulous; leaflets linear, obtuse; legumes filiform, cylindrical, moniliform; stem herbaceous." *Root* biennial. Rachis of the leaves not prickly. *Flowers* yellow; standard with black spots on the outside. A native of New Spain. 27. *C. virgata*. Willd. 8. (*Æschynomene*; Cav. ic. 3. 47. tab. 293.) "Racemes many-flowered; leaflets elliptical; legumes linear, sword-shaped, compressed, tetragonous; stem herbaceous." *Flowers* yellow. A native of New Spain.

C. zeylanica, *flore albo*; et *flore purpurascente*. Burm. See *GALEGA villosa* β and *G. purpurea*.

CORONILLA, in *Gardening*, comprises plants of the evergreen and deciduous shrubby kinds. Of which there are several species in cultivation, as the linear-leaved coronilla (*C. juncea*); the small shrubby coronilla (*C. valentina*); silvery-leaved coronilla (*C. argentea*); great shrubby coronilla (*C. glauca*); and the scorpion fena (*C. emerus*). See the preceding article.

Method of Culture.—From the four first sorts, and particularly the second, being rather tender, though they are capable of succeeding in the open air, in mild winters, they should in common be potted, to be moved to the shelter of a green house, or glass frame, or some sheltered situation in the full ground. The two last are hardy and elegant flowering shrubs, for the clumps and other parts of extensive pleasure and other ornamented grounds. It is easy to raise the four first sort by seeds, which should be sown in the spring, either on a warm border, or in a slender hot-bed; but the latter is the better mode, as it produces them more forward in pots of rich earth, half an inch in depth, plunging them in a hot-bed when necessary. After the plants are two or three inches in height, they should be pricked out in separate small pots, giving shade, water, and air, hardening them gradually to the full air, about the middle of summer, in which they may remain till autumn, then removing them to the shelter of a frame during winter, covering them only in time of frost or very severe weather in the winter.

With respect to the last sort, the scorpion fena, it may be raised plentifully both by seeds, layers, and cuttings; the seeds should be sown in March, in a bed of light earth, and covered half an inch deep, giving occasional waterings in dry weather. When the plants have had one or two years growth, they must be removed into nursery rows, and in two or three more, they will be large enough for planting in the shrubbery, or other places. The layers of the young shoots may be laid down in autumn, or winter, giving them a gentle twist before they are put down. When they are perfectly rooted, they should be taken off, and planted in the above manner. The cuttings of the young shoots may be planted in the spring or autumn, in shady borders, giving them water the following spring and summer. When well rooted, they should be removed, as in the above method.

The first sort have a fine effect in the green house, and the last in the shrubbery borders.

CORONOPUS, in *Botany*, (from *κορωνη*, a crow, and *πους*, foot.) Gært. 831. Smith Flor. Brit. 298. Vent. 3. 109. Class and order, *pentandria siliculosa*. Nat. Ord. *Siliquosa*, Linn. *Crucifera*, Juss.

Gen. Ch. *Cal.* Perianth four-leaved. *Cor.* Petals four. *Stam.* Filaments six; two or four sometimes wanting. *Pist.* Germ heart-shaped; style simple, very short, permanent; stigmas obtuse. *Peric.* Silicle, roundish-kidney-shaped, compressed, wrinkled, two-celled, without valves. *Seed* one in each cell.

Eff. Ch. Silicle wrinkled, valveless.

Sp. 1. *C. ruellii*. Gært. tab. 142. fig. 1. Smith Eng. Bot. 1660. (*Cochlearia coronopus*. Linn. *Nasturtium lupinum*, capsulis verrucosis; Rai. Syn. 304.) "Silicles undivided, crested with sharp points; style prominent; corymbs with few flowers." *Root* annual. *Stems* quite prostrate, depressed, branched, leafy, smooth. *Leaves* alternate, smooth, somewhat glaucous, pinnatifid; segments often half pinnatifid or pectinate on their fore-side. *Corymbs* opposite to the leaves, sessile, short, elongated into racemes as the fruit advances. *Flowers* small, white. *Silicles* transversely rugged, their plaits extended into little marginal teeth, which form a sort of crest, not emarginate, but terminated by the short pyramidal style, cells leathery. *Seeds* large, brown. The whole plant is slightly succulent, with an unpleasant mustard-like acid flavour. Dr. Smith. A native of England, and other parts of Europe, on road sides, and other waste places. flowering from June to September. 2. *C. didyma*. Smith. Flor. Brit. (*Lepidium didymum*; Linn. Sp. Pl. Eng. Bot. 248.) "Silicles emarginate, didymous, reticularly wrinkled; style obsolete; corymbs many-flowered." Less than the preceding. *Root* annual. *Stems* procumbent, cylindrical, hairy, branched, leafy. *Leaves* alternate, smooth, pinnatifid; segments toothed, especially on the fore-side. *Corymbs* generally opposite to the leaves, soon elongated into racemes. *Flowers* small, white; stamens seldom more than two or four. *Silicle* very distinctly two-lobed. A native of Pembroke-shire, Devonshire, and Cornwall.

CORONOPUS bortenfis; Bauh. Pin. Tourn. See **PLANTAGO Coronopus**.

CORONOPUS maritimus major; Bauh. Pin. See **PLANTAGO Maritima**.

CORONOS, or **CORONUS**, *Mons*, in *Ancient Geography*, a mountain of Asia, which made a part of mount Taurus. The western part of this mountain was in Media.

CORONTA, a town of Acarnania, according to Thucydides.

COROORA, in *Geography*, one of the Pelew islands; the capital of which is Pelew, whence the whole group derived its appellation. See **PELEW**.

COROPA, or **COROPE**, in *Ancient Geography*, a town of Greece, in Thessaly.

COROPASSUS, a village of Asia Minor, in Lycaonia, according to Strabo, on the confines of Cappadocia.

COROPITÆ. See **AGONISTICI**.

COROSAIM, a town of the Decapolis, situated on the banks of the sea of Galilee, N. of this sea, and near Bethsaida. It is placed by Eusebius about two miles from Capernaum.

CORPACH, in *Geography*, a small village in Argyleshire, in Scotland, is about 2 miles nearly north from Fort-William, situate on the eastern shore of Loch Eil. This place cannot fail of obtaining celebrity in future, on account of the great works which are now carrying on for the western entrance-basin and locks of the great Inverness and Fort-William, or Caledonian, canal, intended to form a communication for large ships between the East and West seas, and avoid the large and often dangerous passage round the north of Scotland. The laborious operation of excavating, or rather hewing and blasting the hard rock, in which the locks at this place are to be built, was begun in July 1804; and, in December of the same year, the formation of two immense banks of earth, (nearly similar to those we have mentioned as constructing at the eastern entrance at CLACHNACARY) was begun to extend into Eil Loch, for surrounding and protecting the sea or entrance lock,

lock, which is to be formed where the surface of the rocky stratum of this district is 20 feet under the line of high water of ordinary neap tides, but where the rock shelves off, so that no cutting will be required at the tail of the rock, from whence the depth of water in the lock gradually deepens through 4, 5, 6, 7, 8, and 13 to 16 fathoms, at the distance of about three quarters of a mile. There is a projecting head of rock in this place, which will form the body of a pier to protect the tide-lock. The rise of those locks, which are to be constructed behind Corpach house, will bring the bottom of the canal upon the top of the stratum of rock; into which the lock, connecting with the first or sea-lock, will be cut 11 feet 9 inches, and the third lock will be cut 4 feet into the rock. For the space of a mile and quarter from these locks eastward, the cutting of the canal is level on Corpach Moss, in strong compact sandy gravel, under about two feet of peat-moss. According to the report of Messrs. T. Telford and W. Jessop, the principal engineers in this important concern, which was ordered to be printed by the house of commons on the 2d June 1806, it appears, that an engine-house had been built, and one of Boulton and Watt's 20 horse steam-engines fitted up, for pumping the water from the foundations of the first and second locks at Corpach; where the side-walls of the third lock from the entrance of the canal had been built, to the height of 12 feet above the bottom, which is rock, requiring no inverted arch upon it; the fore-bay was completed, and also the tail-bay, forming here, also, the fore-bay of the second lock; for these ingenious engineers have adopted the plan of placing the locks on this great canal in groups, and making the head-gates of one lock act as the tail-gates of the rest, as they do at Runcorn, on the duke of Bridgewater's canal. The mortar used in these works, is from the lime-stone of Linmore island, at the mouth of the bay of Lochyol in Argyleshire, and is found to be an excellent water cement, after being exposed to the tide during a winter. The bank which is to inclose the north side of the sea-lock, had been carried forwards from high water mark, a hundred and forty yards into the lock, and two rail-ways of eight hundred, and five hundred yards long, respectively, had been laid for conveying gravel to this sea-lock, and to the second and third locks, as well as rough quarry stones, for facing the outside of the bank, as it proceeds, and defending it from the surf of the lock. The timbers and piles have been prepared for forming a coffer dam at the extremity and within this bank, for putting in the foundations of the sea-lock.

The first aqueduct at this end of the canal at Bannavie, is finished, consisting of two arches, 9 feet wide, 10 feet high, and 252 feet long, this being the width of the canal and its banks in this place, constructed of stone quarried near the spot. The locks at Corpach are building with stone of good quality, quarried at Fallefern, about 2½ miles north of that place, on the eastern bank of Loch Eil. The second aqueduct at this end of the canal, over the long river at Strone, was commencing, consisting of a centre arch of 25 feet diameter, and two side-arches 10 feet wide each; these last being paved with stones on edge, are intended as road-arches for communication between the different sides of the canal, except perhaps during the height of the largest floods in this river. Great part of the cutting and banking for the canal between Corpach and Loch Lochy, was in hand or finished, but the grand chain of eight locks between Corpach Moss and Bannavie was not begun, or intended so to be, until the sea-lock and the other two locks at Corpach are completed, so as to admit the stone vessels to proceed thus far up the line, to discharge

their cargoes for building these stupendous locks. See CANAL.

CORPEAU, a town of France, in the department of the Cote d'Or, and district of Beaune; 7 miles S. of Beaune.

CORPICENSII, in *Ancient Geography*, a people of the island of Sardinia.

CORPILIACA, a country and government of Thrace, on the side of Macedonia.

CORPIELLI, a people of Thrace, according to Pliny. Hardouin assigns them the towns of Perinthus, Ganos, and Sapos.

CORPOON'S BAY, a bay on the N. W. coast of the island of St. Christopher; two miles S. W. of Diep town.

CORPORA *cavernosa penis et clitoridis*, in *Anatomy*. See CAVERNOSA corpora.

CORPORA *olivaria*, two slight eminences in the commencement of the medulla spinalis. See BRAIN.

CORPORA *pyramidalia*, two small projections situated close to the former ones.

CORPORA *quadrigenina*, a square portion of medullary substance, situated behind and below the thalami nervorum opticorum, and divided in its surface into four eminences, which are also called the nates and testes. See BRAIN.

CORPORA *striata*, the grey pyriform bodies which occupy the anterior and outer part of the lateral ventricles of the brain. See BRAIN.

CORPORA *subrotunda*, or *mamillaria*, or *candicantia*; two small hemispherical medullary bodies in the basis of the brain, behind the infundibulum. See BRAIN.

CORPORA *Habeas*, in *Law*. See HABEAS.

CORPORAL, in *Military Language*, a rank and file man, with superior pay to that of common soldiers, and with nominal rank as a sergeant. He has charge of one of the squads of the company, places and relieves sentinels, and keeps good order in the guard to which he belongs. He receives the word of the inferior rounds, that pass by his guard. Every company has three or four corporals.

The word comes from the Italian *corporale*, which signifies the same thing; and that from *caput*, head, chief; the corporal being the first of the company.

CORPORAL *Lance*, a person who acts as corporal, but receives pay only as a private.

CORPORAL *of a ship*, is an officer who hath the charge of setting the watch and centries, and relieving them; and who sees that all the soldiers and sailors keep their arms neat and clean: he also teaches them how to use their arms, and hath a mate under him.

CORPORAL *oath*. See OATH.

CORPORAL, *Corporale*, is also an ancient church term, signifying the sacred linen spread under the chalice in the eucharist and mass, to receive the fragments of the bread, if any chance to fall. Some say it was pope Eusebius who first enjoined the use of the corporal; others ascribe it to St. Silvester. It was the custom to carry corporals, with some solemnity, to fires, and to heave them against the flames, in order to extinguish them. Philip de Comines says, the pope made Louis XI. a present of the corporale, whereon my lord St. Peter sung mass.

CORPORATE COUNTY. See COUNTY *corporate*.

CORPORATION, a body politic, or incorporate; so called, because the several members thereof are formed into one body; and are qualified to take, purchase, grant, have a common seal, sue and be sued, &c. in their joint capacity.

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Of these corporations a great variety is subsisting, for the advancement of religion, of learning, and of commerce; in order to preserve entire and for ever those rights and immunities, which, if granted only to the individuals composing the body corporate, would upon their death be utterly lost and extinct. In proof of the advantage of these incorporations, judge Blackstone adduces the case of a college in either of our universities, founded *ad studendum et orandum*, for the encouragement and support of religion and learning. As a mere voluntary assembly, the members that compose it might read, pray, study, and perform scholastic exercises together, so long as they could agree to do so; but they could neither frame, nor receive any laws or rules for their conduct; none at least, which would have any binding force, for want of a coercive power to create a sufficient obligation. Neither could they be capable of retaining any privileges or immunities; for, if such privileges be attached, which of this whole unconnected assembly has the right, or ability, to defend them? and, when they are dispersed by death or otherwise, how shall they transfer these advantages to another set of students, equally unconnected as themselves? So also, with regard to holding estates or other property, if land be granted for the purposes of religion or learning to twenty individuals not incorporated, there is no legal way of continuing the property to any other persons for the same purposes, but by endless conveyances from one to the other, as often as the hands are changed. But when they are consolidated into a corporation, they and their successors are considered as one person in law; as one person, they have one will, which is collected from the sense of the majority of the individuals; this one will may establish rules and orders for the regulation of the whole, which are a sort of municipal laws of this little republic; or rules and statutes may be prescribed to it at its creation, which are then in the place of natural laws:—the privileges and immunities, the estates and possessions of the corporation, when once vested in them, will be for ever vested, without any new conveyance to new successors; for all the individual members that have existed from the foundation to the present time, or that shall ever hereafter exist, are but one person in law, a person that never dies.

These political constitutions were first invented and introduced, according to Plutarch, among the Romans by Numa, in order to break the force of the two rival factions of Sabines and Romans; by instituting separate societies of every manual trade and profession.

They were afterwards much considered by the civil law, in which they were called *universitates*, as forming one whole out of many individuals, or *collegia*, from being gathered together; they were adopted also by the canon law, for the maintenance of ecclesiastical discipline; and from them our spiritual corporations are derived. For the rise and gradual advancement of corporations or communities, and their favourable influence with regard to the introduction of regular government, police, and arts, and the diffusion of them through Europe, together with the invaluable advantages of personal security and general liberty; see *CITY* and *CHARTERS of Community*. These communities, which by augmenting the wealth and importance, and concentrating the powers of individuals, were eminently useful in checking the oppression of the feudal government, and extending personal and political liberty, became, however, in process of time injurious, by their exclusive privileges and restraining laws, to the freedom and liberty of individuals, and to the general interests of commerce. In order to erect a corporation, no other authority in ancient times was requisite in many parts of Europe, but that of the town cor-

porate, in which it was established. In England, indeed, a charter from the king was likewise necessary. But this prerogative of the crown seems to have been reserved rather for extorting money from the subject, than for the defence of the common liberty against oppressive monopolies. Upon paying a fine to the king, the charter seems generally to have been readily granted; and when any particular class of artificers or traders thought proper to act as a corporation without a charter, such "adulterine guilds," as they were called, were not always disfranchised upon that account; but obliged to pay an annual fine to the king for permission to exercise their usurped privileges. The immediate inspection of all corporations, and of the bye-laws which they might think proper to enact for their own government, belonged to the town corporation in which they were established; and whatever discipline was exercised over them, proceeded commonly, not from the king, but from that greater incorporation of which these subordinate ones were only parts or members. The government of towns corporate was altogether in the hands of traders and artificers; and it was the manifest interest of every particular class of them to prevent the market from being over-stocked, as they commonly express it, with their own particular species of industry; which is, in reality, to keep it under-stocked. Each class was eager to establish regulations for this purpose, and, provided it was allowed to do so, was willing to consent that every other class should do the same. In consequence of such regulations, indeed, each class was obliged to buy the goods they had occasion for from every other within the town, somewhat dearer than they otherwise might have done. But in recompence, they were enabled to sell their own just as much dearer; and in the dealings of the different classes within the town with one another, none of them were losers by these regulations. But in their dealings with the country they were all great gainers; and in these latter dealings consists the whole trade which supports and enriches every town; because every town draws its whole subsistence, and all the materials of its industry, from the country. Dr. Smith, in his "Nature and Causes of the Wealth of Nations" has shewn in what way corporations check the operations of competition; and how their internal regulations serve to produce effect as combinations against the public, and as injuries even to the members of these corporations. Corporation laws, he says, obstruct the free circulation of labour, from one employment to another; and this effect they produce in a greater degree than they obstruct the circulation of stock from one place to another for this obvious reason; because it is every where much more easy for a wealthy merchant to obtain the privilege of trading in a town corporate than for a poor artificer to obtain that of working in it. The obstruction which corporation laws give to the free circulation of labour is common to every part of Europe; but that which is given to it by the poor laws is, as far as Dr. Smith knows, peculiar to England. It consists in the difficulty which a poor man finds in obtaining a settlement, or even in being allowed to exercise his industry in any parish but in that to which he belongs. It is the labour of artificers and manufacturers only of which the free circulation is obstructed by corporation laws. The difficulty of obtaining settlements obstructs even that of common labour. After illustrating and comparing the condition of soldiers and seamen with that of manufacturers, and observing that the former are at liberty to exercise any trade within any town or place of Great Britain or Ireland, Dr. Smith adds, "Let the same natural liberty of exercising what species of industry they please, be restored to all his majesty's subjects, in the same manner as to soldiers and seamen;

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seamen; that is, break down the exclusive privileges of corporations, and repeal the statute of apprenticeship, both which are real encroachments upon natural liberty, and add to these the repeal of the law of settlements, so that a poor workman, when thrown out of employment either in one trade or in one place, may seek for it in another trade or in another place, without the fear either of a prosecution or of a removal, and neither the public nor the individuals will suffer much more from the occasional disbanding some particular classes of manufacturers than from that of soldiers."

It is beside our purpose to detail the history of particular corporations; and to trace, either to their causes or their consequences, the irregularities that have arisen from the establishment of restraining, exclusive and oppressive laws; and from the assumption and exercise of improper powers, on the part of those with whom the conduct and superintendance of them have been intrusted. Without descending into this minute detail, and pointing out errors and abuses of a local nature that require to be corrected in particular instances, we shall proceed with our account of corporations in general.

Of corporations, some are *aggregate* and others *sole*. The former consist of many persons united together into one society, and are kept up by a continual succession of members, so as to continue for ever; such are the mayor and commonalty of a city, the head and fellows of a college, the dean and chapter of a cathedral church. The latter consist of one person only and his successors, in some particular station, who are incorporated by law, in order to give them some legal capacities and advantages, particularly that of perpetuity, which they could not have had in their natural persons. In this sense the king is a sole corporation; so is a bishop; so are some deans, and prebendaries, distinct from their several chapters; and so is every parson and vicar. (See PARSON.) Again, corporations, both sole and aggregate, are divided into *ecclesiastical* and *lay*. *Ecclesiastical* corporations are formed of members, who are altogether spiritual persons; such as bishops, certain deans, and prebendaries; all archdeacons, parsons, and vicars; deans and chapters, at present, and formerly prior and convent, abbot and monk, and the like, bodies aggregate. These were created for the furtherance of religion, and for perpetuating the rights of the church. *Lay* corporations are either *civil* or *elemosynary*. The *civil* are established for a variety of temporal purposes. Thus the king is made a corporation to prevent in general the possibility of an *interregnum* or vacancy of the throne, and to preserve entire the possessions of the crown. Other lay corporations are created for the good government of a town, or particular districts:—as a mayor and commonalty, bailiff and burgesses, &c.;—some for the advancement and regulation of manufactures and commerce; as the trading companies of London; and of other towns;—and some for the more effectual accomplishment of various special purposes; as churchwardens, for conservation of the goods of the parish; the college of physicians and that of surgeons in London, for the improvement of the medical science; the royal society for the advancement of natural knowledge; and the society of antiquaries for promoting the study of antiquities. To this class judge Blackstone is inclined to refer the universities of Oxford and Cambridge. (See UNIVERSITY.) The *elemosynary* corporations are such as are constituted for the perpetual distribution of the free alms, or bounty, of the founder of them to purposes agreeable to his direction. Of this kind are all hospitals for the maintenance of the poor, sick, and impotent; and all colleges, both in our universities, and out of them, such as at Manchester, Eton, Winchester, &c.;

which colleges are founded for the promotion of piety and learning by proper regulations and ordinances, and for affording assistance to the members of these bodies, in order to enable them to prosecute their devotion and studies with greater ease and assiduity. All these elemosynary corporations are, strictly speaking, lay and not ecclesiastical, even though composed of ecclesiastical persons (1 *Ld. Raym.* 6.), and although they partake in some things of the nature, privileges, and restrictions of ecclesiastical bodies.

Corporations are created by common law, by prescription, and by act of parliament. Indeed, by the civil law, corporations seem to have been created by the mere act, and voluntary association of their members; provided such convention was not contrary to law, for then it was "*illicitum collegium.*" The consent of the prince does not seem to have been necessary, or to have been actually given, to the foundation of them: but, in England, the king's consent is absolutely necessary to the creation of any corporation, either implicit or express. This implicit consent is found in corporations which exist by force of the *common law*, to which our former kings are supposed to have given their concurrence. Of this sort are the king himself, all bishops, parsons, vicars, church-wardens, and some others, who, by common law, have ever been held to have been corporations, "*virtute officii;*" and this incorporation is so inseparably annexed to their offices, that we cannot frame a complete legal idea of any of these persons, but we must also have an idea of a corporation, capable of transmitting his rights to his successors, at the same time. Another method of implication, by which the king's consent is presumed, is as to all corporations *by prescription*, such as the city of London, and many others, which have existed as corporations for time immemorial, and are therefore regarded in law as well-created. The methods by which the king's consent is expressly given are either by act of parliament, or by charter. With regard to corporations created by act of parliament, it is observed, that (till of late years) most of those statutes, which are usually cited as having created corporations, do either confirm those which have been before created by the king, as in the case of the college of physicians, erected by charter 10 Hen. VIII., which charter was afterwards confirmed in parliament; or they permit the king to erect a corporation *in futuro*, with such and such powers, as is the case of the bank of England (stat. 5 & 6 W. & M. c. 20.), and the Society of the British fishery (stat. 23 Geo. II. c. 4.): so that the immediate creative act was usually performed by the king alone, in virtue of his royal prerogative. All the other methods by which corporations exist, by common law, by prescription, and by act of parliament, are for the most part reducible to this, of the king's letters patent, or charter of incorporation. The parliament, by its absolute and transcendent authority, may perform this, or any other act whatsoever; and actually did perform it, to a great extent, by statute 39 Eliz. c. 5. which incorporated all hospitals and houses of correction, founded by charitable persons; and the same has been done in other cases of charitable foundations. But otherwise it has not formerly been usual thus to intrude upon the prerogative of the crown, and the king may prevent it when he pleases.

The king, it is said, may grant to a subject the power of erecting corporations, though the contrary was formerly held (Yearbook, 2 Hen. VII. 13.); that is, he may permit the subject to name the persons and powers of the corporation at his pleasure; but it is really the king that erects, and the subject is merely the instrument; for though none but the king can make a corporation, yet "*qui facit*

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per alium, facit per se." Thus the chancellor of the university of Oxford has power, by charter, to erect corporations; and has actually often exerted it, in the erection of several matriculated companies, now subsisting, of tradesmen subservient to the students. When a corporation is erected, it receives a name, by which it must sue and be sued, and do all legal acts; and this name is essential to its constitution, for, without it, it could not perform its corporate functions. After a corporation is erected and named, it acquires many powers, rights, capacities, and incapacities, which are necessarily and inseparably incident to every corporation. These powers and rights are, 1. To have perpetual succession. 2. To sue or be sued, implead or be impleaded, grant or receive, by its corporate name, and do all other acts as natural persons may. 3. To purchase lands, and hold them, for their own benefit and that of their successors. 4. To have a common seal, the fixing of which, and that only, unites the several assents of the individuals who compose the community, and makes one joint assent of the whole. 5. To make by-laws or private statutes, for the better government of the corporation; which are binding upon themselves, unless they are contrary to the law of the land, in which case they are void. This right of making by-laws was allowed by the law of the Twelve Tables at Rome. But no trading company is, with us, allowed to make by-laws, which may affect the king's prerogative, or the common profit of the people, under penalty of 40*l.*, unless they be approved by the chancellor, treasurer, and chief justices, or the judges of assize in their circuits; and even though they be so approved, still, if contrary to law, they are void. (19 Hen. VII. c. 7. 11 Rep. 54.) These five powers are inseparably incident to every corporation, at least to every corporation *aggregate*; for two of them, though they may be practised, are nevertheless unnecessary to a corporation *simple*; *viz.* to have a corporate seal to testify his sole assent, and to make statutes for the regulation of his own conduct.

To an aggregate corporation belong certain privileges and disabilities, which are not applicable to such as are sole: it must always appear by attorney; it can neither maintain, nor be made defendant to, an action of battery, or such like personal injuries. A corporation cannot commit treason, or felony, or other crime, in its corporate capacity; neither is it capable of suffering a traitor's or felon's punishment. It cannot be executor or administrator, or perform any personal duties; for it cannot take an oath for the due execution of the office. It cannot be seised of lands, to the use of another; for such kind of confidence is foreign to the end of its institution. Neither can it be committed to prison, for no man can apprehend or arrest it, as its existence is merely ideal; of course, it cannot be outlawed; and, therefore, the proceedings, to compel a corporation to appear to any suit of attorney, are always by distress on its lands and goods. A corporation cannot be excommunicated, nor is it liable to be summoned, on any account, into the ecclesiastical court. (10 Rep. 32. Plowd. 538. Bro. Abr. tit. *Corporation*, 11. 43. Outlawry, 72.) There are other incidents and powers, which belong to some corporations and not to others: *e.g.* An aggregate corporation may take goods and chattels for the benefit of itself and its successors, which a sole corporation cannot do. In ecclesiastical and eleemosynary foundations, the king or the founder may give them laws and statutes, which they are bound to observe; but corporations merely lay, constituted for civil purposes, are subject to no particular statutes, but the common law, and to their own by-laws, not contrary to the laws of the realm. Aggregate corporations also, that

have a head by their constitution, as a dean, master, warden, &c. cannot perform any acts, during the vacancy of the headship, excepting only the appointment of another; neither are they capable of receiving any grant, for such corporation is incomplete without a head. But a corporation aggregate may be constituted without a head; as the collegiate church of Southwell in Nottinghamshire, which consists only of prebendaries; and the governors of the Charter house, London, who have no president or superior, but are all of equal authority. In aggregate corporations also, the act of the major part is esteemed the act of the whole: by the civil law, this major part consisted of two-thirds of the whole; but with us, any majority is sufficient to determine the act of the whole body: and, for settling this point, it was enacted by statute 33 Hen. VIII. c. 27. that all private statutes shall be utterly void, whereby any grant or election, made by the head, with the concurrence of the major part of the body, is liable to be obstructed by one or more, being the minority: but this statute does not extend to any negative or necessary voice, given by the founder to the head of any such society. At common law, corporations have a capacity of purchasing lands for themselves and their successors; but they are excepted out of the statute of wills (34 Hen. VIII. c. 5.); so that no demise of lands to a corporation by will is good, except for charitable uses, by 43 Eliz. c. 4; which exception is again greatly narrowed by 9 Geo. II. c. 36. (Co. Litt. 46. L. Raym. 8. Co. Litt. 265, 264. 10 Rep. 30. Bro. Abr. tit. *Corporation*, 31. 34. Hob. 136.) See MORTMAIN.

The general duties of all bodies politic, considered in their corporate capacity, may be reduced to this single principle: that of conforming to the end or design, whatever it be, for which they were created by their founder. As all corporations are liable to deviate from the end of their institution, they are subject to inspection and visitation. The ordinary is the visitor of all ecclesiastical corporations, so constituted by the canon law, and thence derived to us. Thus, the king (formerly the pope), as supreme ordinary, is the visitor of the archbishop or metropolitan; the metropolitan has the charge and exercise of all his suffragan bishops; and the bishops, in their several dioceses, are, with regard to ecclesiastical matters, the visitors of all deans and chapters, of all parsons and vicars, and of all other spiritual corporations. With respect to all lay corporations, the founder, his heirs, or assigns, are the visitors, whether the foundation be civil or eleemosynary; for, in a lay incorporation, the ordinary neither can nor ought to visit. (10 Rep. 31.) The founder of all corporations, in the strictest and original sense, is the king alone; for he only can incorporate a society: and in civil incorporations, such as mayor and commonalty, &c. where no possessions or endowments are given to the body, the king is the sole founder; but in eleemosynary foundations, such as colleges and hospitals, where there is an endowment of lands, the law distinguishes and makes two species of foundation: the one, "*fundatio incipiens*," or the incorporation, in which sense the king is the general founder of all colleges and hospitals; the other, "*fundatio perficiens*," or the dotation of it, in which sense the first gift of the revenues is the foundation, and he who gives them is in law the founder: and thus we generally call a man the founder of a college or hospital. (10 Rep. 33.) But the king has here his prerogative; for, if the king and a private man join in endowing an eleemosynary foundation, the king alone shall be the founder of it. And, in general, the king being the sole founder of all civil corporations, and the endower the perficient founder of all eleemosynary ones, the right of visitation of the former results, according to the rule

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laid down, to the king; and of the latter, to the patron or endower. The place in which the king visits all civil corporations is the court of king's bench; where, and where alone, all misbehaviours of this kind of corporations are inquired into and redressed, and all their controversies decided.

As to eleemosynary corporations, by the donation the founder and his heirs are, of common right, the legal visitors, to see that such property is rightly employed, as might otherwise have descended to the visitor himself; but if the founder has appointed and assigned any other person to be visitor, then his assignee is invested with the whole power of the founder, in exclusion of his heir. Eleemosynary corporations are chiefly hospitals, or colleges in the universities. With regard to hospitals, it has been long held, (Yearbook, 8 Edw. III. 28. 8 Aff. 29.) that if the hospital be spiritual, the bishop shall visit; but if lay, the patron. By stat. 14 Eliz. c. 5. the bishop is directed to visit such hospitals only, where no visitor is appointed by its founders; and all hospitals, founded by virtue of the statute 39 Eliz. c. 5. are to be visited by such persons as shall be nominated by the respective founders. But if the founder appoint no visitor, the bishop of the diocese must visit. (2 Inst. 725.)

Colleges in the universities were formerly considered by the popish clergy, to whose direction they were subject, as ecclesiastical, or, at least, as clerical, corporations; and therefore the right of visitation was claimed by the ordinary of the diocese. In some of our colleges, where no special visitor is appointed, the bishop of the diocese, in which Oxford was formerly comprised, has immemorially exercised visitatorial authority, which can be merely ascribed to his supposed title as ordinary to visit this, among other ecclesiastical foundations. Nor is it impossible, that the number of colleges in Cambridge, that are visited by the bishop of Ely, may in part be derived from the same original. But whatever might formerly be the opinion of the clergy, it is now held as established common law, that colleges are lay corporations, though sometimes wholly composed of ecclesiastical persons; and that the right of visitation does not arise from any principles of the canon law, but, of necessity, was created by the common law. (Lord Raym. 8.) In a disputed case, which was reviewed in the court of king's bench, and there redressed under the sanction of the three puisne judges; lord chief justice Holt, being of a contrary opinion, held, that by the common law, the office of visitor is to judge according to the statutes of the college, and to expel and deprive on all just occasions, and to hear all appeals of course; and that from him, and him only, the party grieved ought to have redress. The house of lords, on a writ of error, concurred in this opinion, and reversed the judgment of the court of king's bench. To this leading case, all subsequent determinations have been conformable. But when the visitor is under a temporary disability, then the court of king's bench will interpose to prevent a defect of justice. (Stra. 797.) And, it is said, (2 Lutw. 1566.) that if a founder of an eleemosynary foundation appoint a visitor, and limit his jurisdiction by rules and statutes, if the visitor in his sentence exceeds those rules, an action lies against him; but it is otherwise when he mistakes in a thing within his power.

A corporation may be dissolved in various ways: 1. By act of parliament. 2. By the natural death of all its members, in case of an aggregate corporation. 3. By surrender of its franchises into the hands of the king, which is a kind of suicide. 4. By forfeiture of its charter, through negligence or abuse of its franchises; in which case the law

judges, that the body politic has broken the condition upon which it was incorporated, and therefore the incorporation is void. In this case, the regular course is to bring an information in nature of a writ "quo warranto," to inquire by what warrant the members now exercise their corporate power, having forfeited it by such and such proceedings. The exertion of this act of law, for the purposes of the state, in the reigns of king Charles and king James II., particularly by seizing the charter of the city of London, gave great and just offence; but the judgment against that of London was reversed by act of parliament (stat. 2. W. and M. c. 8.) after the revolution; by which statute it is enacted, that the franchises of the city of London shall never more be forfeited for any cause whatsoever. And, because by the common law, corporations were dissolved, in case the mayor or head-officer was not duly elected on the day appointed in the charter, or established by prescription; it is now provided, (stat. 11. Geo. I. c. 4.) that for the future no corporation shall be dissolved upon that account; and ample directions are given for appointing a new officer, in case there be no election, or a void one, made upon the prescriptive or charter day. Blackst. Com. vol. 1.

CORPORATION *act*, is that which prevents any person from being legally elected to any office relating to the government of any city or corporation, unless, within a twelve-month before, he has received the sacrament of the Lord's supper, according to the rites of the church of England; and which enjoins him to take the oaths of allegiance and supremacy when he takes the oath of office; otherwise his election is void. Stat. 13. Car. II. stat. 2. cap. 1. By this act, all non-conformists were turned out of every department of magistracy at once, and rendered incapable of serving their country in the offices of a common-councilman, or a burgher or bailiff of the smallest corporation. Accordingly they have complained of their ineligibility to such offices, in common with the rest of their fellow-subjects, as a grievance, and have often, but hitherto unsuccessfully, sought redress. If they possess every other qualification, which pertains to loyal subjects and zealous patriots, for occupying civil offices, with the honours and emoluments connected with them, in the corporate towns, to the wealth and prosperity of which they have contributed by their industry and activity, besides external conformity to a religious rite, according to the forms of the established church, which, it has been said, is no unequivocal and decisive evidence of being actually members of that church, their advocates allege, that they ought not to be excluded. On the other hand, it has been pleaded, that offices of trust and influence should be conferred only on *bona fide* members of the established church; and that by this restriction, the safety of the church and of the state is most effectually guarded and promoted. How far the corporation and test acts are founded in justice and sound policy, and to what degree they serve to secure our civil and religious liberties, as judge Blackstone conceives them to do, are questions which have been frequently discussed both in and out of parliament; and, by the determination of the majority, they are still continued. For a view of the arguments in their favour and against them, we refer to the article TEST. Soon after the corporation act was passed in the year 1661, commissioners were appointed, and employed during that and the following year, to visit the several corporations in England, and to turn out of office such as were in the least suspected. These commissioners executed their office with so much rigour, that the corporations had not one member left, who was not entirely devoted to the king and the church.

CORPORATION *courts* are such as are held in corporations,
by

by prescription, charter, or act of parliament. See COURT *of Holdings* and *Mayor's Courts*.

CORPORATION *of the sons of the clergy*. See CLERGY.

CORPOREAL. See CORPOREITY and INCORPOREAL.

CORPOREAL *hereditaments*. See HEREDITAMENTS.

CORPOREAL *qualities*. See QUALITY.

CORPOREITY, the quality of that which is corporeal, or has body; or that which constitutes or denominates it such.

The corporeity of God was the capital error of the Anthropomorphites. Some authors reproach Tertullian with admitting a corporeity in the Deity; but it is manifest, by *body* he means no more than *substance*.

The Mahometans reproach the Samaritans at this day, with a belief of the corporeity of God. Many of the ancients believed the corporeity of angels.

CORPOREITY, *form of*. See FORM.

CORFORIFICATION, in *Chemistry*, the operation of recovering spirits into the same body, or at least into a body nearly the same with that which they had before their spiritualization.

CORPS, in *Architecture*, is a term borrowed from the French, signifying any part that projects or advances beyond the naked of a wall; and which serves as a ground for some decoration, or the like.

CORPS, in *Geography*, a small town of France in the department of the Isère, in the district of Grenoble, 27 miles S.E. of that place, and six miles N. of Lesdiguières. It contains 1038 inhabitants, and the canton, of which it is the chief place, has 13 communes, with a population of 4441 individuals, on a territorial extent of 120 kilometres.

CORPS, in *Military Language*, any body of troops or forces, destined to act in a body together under one person who commands them.

CORPS *de Bataille*, Fr. is the main body of an army that marches between the advanced and the rear-guard.

CORPS *de-garde*, Fr. an inferior post, which is sometimes covered in, and at other times is in the open air, garrisoned and defended by troops, who are occasionally relieved, and whose immediate and principal duty is to prevent a post of greater consequence from being surprised. It is frequently a lodgment level with the ground for putting the soldiers under cover, who are destined to defend a post, and it ought always to be vaulted to provide against accidents by fire. *Corps de garde*, in the French acceptation of the term, signifies not only the place itself, but also the men, who are stationed there to protect it.

CORPS *de gard avancés*, Fr. advanced corps-de-garde.—These posts are occupied by cavalry or infantry according to the exigency of the service, and the nature of the ground. When a camp is covered by intrenchments, and has one line of defence, the corps-de-garde, or advanced post of the cavalry, is on the outside of the line, and each part has its quarter and main-guard, which are always within sight of the said line, unless the irregularity or unevenness of the ground obstruct their view. The quarter-guard, or petit corps-de-garde, is more in front, but always in sight of the main-guard, and the *vedette* is still farther advanced for the security of both.

In garrisoned places, the officers on guard are indispensably obliged to lodge in the *corps-de-garde*, without stripping or taking their cloaths off. They cannot commonly quit it but for one hour to dine, and another to sup; and, on particular emergencies, they should even be obliged to take their meals in it, without quitting it at all. If there be any waste and destruction, or breaking of things in it, the commandant should make them be replaced, or made good at

the expence of the officers, sergeants, and corporals of the guard relieved.

CORPS *d'une place*, Fr. Body of a place, is that which forms the *Enceinte* or perimeter of the place, in the directions of the curtains and bastions. For though the buildings in a fortified place are properly enough said to be the body of the place; yet, in the language of fortification, the enclosure round them is generally understood by it. For we say, *to construct the body of the place*, by which is meant to fortify and enclose it with bastions and curtains.

CORPS *de Reserve*, Fr. Body of reserve: A considerable part of an army posted in time of battle at some distance behind the second line, to be in readiness to furnish succour or support to the weakest posts, or wheresoever it is most wanted.

Vegetius, an ancient military writer, expresses his decided opinion, that a corps de reserve was indispensably necessary. "It is," says he, "an excellent method, and must contribute greatly to the gaining of a battle, to have in reserve, behind the army, some chosen troops, both cavalry and infantry, under the command of lieutenant-generals, or other superior officers, not employed in the line. Some of these troops are to post themselves towards the wings, and others towards the centre; being in constant readiness to fly to the assistance of any quarter that may be too hardly pressed, in order to hinder the general disposition from being broken, fill the chasms occasioned by disorder, and check the ardour of the enemy, &c." "If the general, in consequence of not having any troops in reserve, should be obliged to take them from the main body; by thus endeavouring to cover one part, he will only strip another, and increase the danger of the whole.

When a general has no troops to spare, he had better shorten his front, in order to have the more considerable corps de reserve. He should have one towards the centre, composed of chosen infantry, to form the wedge and break the enemy's line; and likewise, some of cuirassiers pikemen and light infantry, towards his wings, to turn the enemy's. "The two last of these maxims of Vegetius, are founded on the practice of the most able generals before his time. Cyrus took care to have reserves at Thymbraea: Julius Cæsar made reserves of six cohorts at Pharsalia: Epaminondas destined the divisions of the phalanx to form the embolon at Mantinea: Alexander employed different lines of light cavalry and light infantry at the battle of Arbela: and his successors imitated his example in their orders of battle.

These kinds of reserve had a fixed destination: that is, they were placed with a design to attempt some blow against the enemy, or parry any, which he might be supposed to attempt: and in this sense Vegetius says, a general should always have a corps de reserve to form the "Wedge" or "forceps;" for if, in order to execute these evolutions, he should take any troops from his line, he may, then, replace the latter with those that are posted in the rear for that purpose.

This manœuvre the Greeks called "parembolos." Arrian has described it in his "Tactics," and classed it with the several dispositions of the phalanx. "The natural effect," says Onofander, a military writer, "of a reinforcement of fresh troops, is to inspire those they join, and dispirit an enemy, already weakened by the length of the engagement." Vegetius and Onofander had established their precepts on the practice of the preceding ages. It appears, however, notwithstanding the acknowledged advantage of corps de reserve, that the Greeks did not always make use of them, except in a small number of extraordinary instances. They always

always drew up in a single line of cavalry and infantry; depending on the depth of their order, and on their light-armed troops, which they formed into a line, in their front or rear; or posted on their flanks, according to the nature of the ground on which they were to engage.

It appears that this use of the corps de reserve is not very ancient. Vegetius attributes the invention of them to the Lacedæmonians; and says, they were first adopted by the Carthaginians, and then by the Romans. The Greeks, better acquainted with tactics, and better disciplined than the Carthaginians, always engaged in single lines of infantry and cavalry; and they derived courage from the depth and solidity of their phalanx. When they had recourse to corps de reserve, it was not with a design to support one line with another, like the Carthaginians. These corps de reserve were either detached troops, formed expressly to make certain independent manoeuvres; and sometimes bodies posted to frustrate the enemy's ambuscades; and these are probably the troops meant by Vegetius, when he tells us, that the Romans borrowed the use of them from the Carthaginians. The Triarii, who in their orders of battle formed the ordinary reserve, entered into the composition of their tactics, which had been perfected a long time before they knew any thing of the Carthaginians. The modern tactic is the same with that of the Romans, but spoiled and corrupted. We draw up, says Maizeroy, in two lines, at 300 paces distance from each other, with the cavalry in like manner on our wings. These two lines, which used to be four deep, are now three; so that the depth of the two, taken together, does not equal half the depth of the phalanx: they are even far from equalling, in depth, a single line among the Romans; and the distance between them seems only to increase their weakness. With an ordonnance so feeble as this of the moderns, reserves are absolutely necessary; and indeed much more necessary than among the ancients. "Troops must be so disposed," says Montecuculi, (B. i. c. 6.) "as to be able to fight again and again: the first line should be the strongest, since it has the greatest efforts to make and to support; the second, a little less; the third may be wholly composed of some reserves." When the order of battle is of little extent, it will be impossible to have more than one reserve of infantry and cavalry behind the centre, or at such a distance as to be able to succour any part of the line, that may happen to want it: if, on the contrary, the enemy makes a great front, it will be better to divide the reserve. In this case, it is usual to make three corps of it, one of which is to be stationed behind the centre of the infantry, and the other two behind the wings. In a regular order of battle, the reserve of infantry is generally placed in the centre; and all the cavalry or dragoons, that can be spared for the same purpose, behind the second line of each wing of the cavalry. On this subject, see M. Joly de Maizeroy's System of Tactics, by Mante, vol. ii.

CORPS les six vieux, Fr. By this expression was meant the regiments of Picardy, Piedmont, Champagne, Navarre, Normandy, and La Marine, because they were raised or formed before any other regiments, and enjoyed prerogatives in the way of honours and command over all other regiments of infantry.

CORPSE, STEALING OF, in Law, is not felony, but punishable as a misdemeanor by indictment at common law; but if a person, in taking up a dead body, steals the shroud, or other apparel, it is felony; for the property thereof remains in the executor, or person who was at the charge of the funeral. 3 Inst. 110. 12 Rep. 113. 1 Hal. P. C. 515

CORPSUND-LES-TROIS-MARIES, in Geography, a town

of France, in the department of the Ille and Vilaine; 5 leagues S. of Rennes.

CORPULENCE, or *CORPULENCY*, from *corpus*, the body, signifies an unusual bulk of the body; and as the increase of bulk is commonly produced by an accumulation of fat in the cells of the adipose membrane, it is synonymous with *obesity* or *fatness*. The nosologists have denominated it *polyfarcia*, from *πολύς*, much, and *σάρξ*, the flesh. Corpulency, however, is to be distinguished from the mere size and quantity of muscle, which constitutes the athletic structure, and which neither produces disease nor inconvenience, nor occasions any deformity in the appearance of the body.

The fat, which in the living body is generally fluid, *i. e.* in the state of an oil, is a secretion from the blood, and is deposited in the common cellular substance. This substance is not only situated under the skin, over the whole body, but penetrates into its inmost recesses, between the different muscles, and even the fibres of the muscles, and enters into the composition of almost all the soft parts. Hence, when the body is corpulent, the fat is found, not only under the skin, but abundantly in the cavity of the belly, about the kidneys and mesentery; in the loins; and particularly in the omentum or caul; whence the general protuberance of the abdomen in fat people. It is found also in the cheeks, in the substance of the mamæ, and about the heart; and it lies between the muscles, filling up the furrows and cavities, and thus rendering the surface of the body and of the limbs round and smooth. With this state of obesity a fullness of the vascular system, or a plethora, is usually combined.

When these circumstances are taken into consideration, it must be obvious, that although corpulency may exist to a certain, even to a considerable, degree, in some persons, without being deemed a disease; yet there is a point to which it cannot advance, without being admitted to be a disease, and conducing to the excitement of other maladies, which tend to shorten life. Hippocrates observed, that corpulent persons are shorter-lived, and more frequently die suddenly, than lean people. Aphor. 44. § 2. Great corpulency necessarily contributes to impede the free exercise of the animal functions. The omentum, as well as other parts of the abdomen, being loaded with fat, the descent of the diaphragm is obstructed, and therefore respiration is performed imperfectly, and with difficulty, and the power of taking exercise is almost totally lost. This load of fat presses also on the large blood-vessels, and on the viscera, and necessarily impedes the full flow of the circulating blood through them. Hence the pulse is generally weaker in fat persons than in others. This general pressure upon the blood-vessels, and impediment to a free circulation, cause an accumulation of blood in the vessels of those parts, where no fat exists, as in the brain and the lungs; whence also respiration is still farther impeded, and the functions of the brain are imperfectly performed. Thus the corpulent often grow dull and sleepy, their memory is impaired, and indisposition to motion ensues; and at last, the brain being oppressed with too great fullness, or by a bursting of the vessels, they die apoplectic, or are seized with a palsy, which adheres to them for life. The compression of fat in the abdomen extends to the viscera of the pelvis; and Hippocrates has deduced even barrenness itself from this cause. "But if a woman grows preternaturally fat," he says, "she does not conceive; for the womb is compressed by the superincumbent distended omentum, whereby conception is prevented." Aphor. 46. § 5. This, however, though frequently, is not invariably, the case. Corpulency also gives

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rise to gout, gravel, indigestion; even to epilepsy and other violent diseases.

The predisposition to corpulency is very various in different constitutions. In some persons, a deposition of fat takes place, in spite of a constant moderation in the gratification of the appetite; while in others, the unlimited indulgence of it is not productive of any degree of fatness. This depends much upon other peculiarities of habit: such as a laxity in the solids, which is connate, often hereditary; a strong digestive power in the stomach; and a cheerful and contented disposition, which is not ruffled into anxiety by trifling occurrences, (whence the truth of the adage, "laugh and be fat:") for corroding cares and anxieties disturb the corporeal functions, especially the digestion and assimilation of the aliment, and of course diminish the supply of blood.

The general exciting cause of corpulency is certainly a free indulgence of the appetite, in the use of nutritious food and fermented liquors. A very cursory observation will be sufficient to prove this. For example, it is only among those, who enjoy the means of obtaining the comforts of life without hard labour, that corpulency is at any time observed. The money-making citizen, the substantial farmer, (and more especially their wives, who enjoy all their feeding, with less exercise and anxiety,) the indolent rector, the serjeants of a regiment in peaceable quarters, the masters of well-accustomed inns and post-houses, &c. &c.; these are the people, whose rotundity of belly marks the superabundance of their *ingesta*, and who wheeze and perspire under a load with which they have voluntarily encumbered themselves. It is not so with the active and the laborious, who are also the poorer part of mankind: the porters and ploughmen, the hewers of wood and drawers of water, do not disfigure and encumber their limbs with fatness; the clerk and the sexton do not vie with the rector in prominence of abdomen; and the common soldier is sufficiently distinguished from his non-commissioned officers, by the mediocrity of his size. The fact, indeed, is too well known and admitted to require any illustration. Whenever a person, of a constitution in the least predisposed to fatness, is enabled to indulge in good feeding, and leads a calm indolent life, free from mental inquietude, and using little corporeal exercise, corpulency generally ensues.

The causes of corpulency being thus well understood, the means of diminishing it are not less obvious, as we shall presently demonstrate.

Instances of considerable degrees of corpulency, giving rise to much inconvenience, impeding the functions, and even ultimately leading to fatal diseases, are very frequent in this country, in consequence of the general consumption of animal food. And occasionally, when the constitutional predisposition conspires with exciting causes, examples of enormous corpulence occur, which are deemed worthy to be recorded. We shall notice only the following:

Mr. John Love was, in the early part of his life, so thin and meagre, that a *tubercle*, or consumption, was apprehended; and having, by the advice of physicians, been provided with every kind of nutritious food, he was led into such habits of indulgence, that he resigned himself entirely to the pleasures of the table. Having commenced business as a bookseller at Weymouth, which required little corporeal exercise, he gave full scope to his propensity for good living, and soon grew as remarkably corpulent and heavy as he was before light and slender; his weight amounting to 26 stone, or 364 pounds. At length, suffocated by fat, he died in the 41st year of his age, in October 1793.

The bulk of this man was, however, considerably exceeded by that of Edward Bright, a grocer, of Malden in Essex. The disposition to corpulence was, in this case, hereditary; many of his ancestors having been remarkably fat, and so early as the age of twelve years and a half, he weighed 10 stone 4 pounds, or 144 pounds. Before he attained the age of twenty, he weighed 24 stone; and increased about 2 stone in each year, so that at the time of his death his weight amounted to 44 stone, or 616 pounds. He was 5 feet 9 inches and a half high; his body round the chest, just under the arms, measured 5 feet 6 inches; and round the belly, 6 feet 11 inches; his arm, in the middle, was 2 feet 2 inches in circumference; and his leg, 2 feet 8 inches. He died at the early age of 30 years, in November 1750. The great constitutional predisposition to fatness was here evinced by the circumstance, that from his childhood to within three years of his death, when he became unwieldy, he took much exercise, and was a nimble and quick walker. But this predisposition of the constitution was not counteracted by his mode of living; for he had always a good appetite, and in his youth was rather remarkable in that respect, and he drank also a considerable quantity of ale and strong beer: latterly his chief drink was small beer, of which he usually drank a gallon a-day. He enjoyed good health during the greater part of his life; but within the last three years he suffered several inflammatory attacks, one of which terminated fatally. After his death, seven men of 21 years of age were enclosed in his waistcoat, in consequence of 2 wagers, "without breaking a stitch or straining a button."

Sennertus mentions an instance of a woman of 36 years of age, who weighed 480, and another of a man whose weight was 600 pounds.

But in Mr. Daniel Lambert, who exhibited himself in London, in the spring of 1806, we have an example of the greatest bulk, perhaps, to which the human body ever arrived. Mr. Lambert was born at Leicester in the year 1770, and was very strong and active in his youth, being an expert swimmer, and much addicted to the sports of the field. Before the age of 20, he found that he was disposed to obesity, and in his 23d year he weighed 30 stone: when he arrived in London, he attained the enormous weight of *fifty stone*, four pounds, or 704 pounds. His height is five feet, eleven inches. He succeeded his father in the office of keeper of the prison at Leicester; and it was within a year after this appointment, that his bulk received the greatest and most rapid increase. This he justly attributes to the confinement and sedentary life to which he was then obliged to submit; especially, as he had formerly been accustomed to active exercise. Mr. Lambert is said to have been temperate; but we have no particular account of his mode of living, except that, in his younger days, he was never accustomed to drinking, although he spent all his evenings in convivial parties, and that at present he drinks no other beverage than water, and eats of one dish only at a time. It is said that he scarcely knows what indispotion is, is cheerful and intelligent, without any difficulty of respiration, and not disposed to drowsiness. Notwithstanding his enormous bulk, he is able to go up stairs with great ease, and "conceives himself," says his biographer, "that he could walk a *quarter of a mile*." He measures nine feet, four inches, round the body, and three feet, one inch, round the leg. The feet and hands are not much enlarged, but the skin, distended with fat, hangs in folds over the ancles. See *Eccentric Mirror*, vol. i. p. 1. *et seq.* 1806.

Cure. In the disease of corpulency, (for whatever condition of body impedes any of its functions, even that of locomotion

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motion only, must be considered as morbid) the patient must principally minister to himself; the cure, and the prevention, will depend almost exclusively upon the proper regulation of his diet and mode of life, and medicine can only be resorted to in order to relieve any casual effects of the corpulent state. The three principal points to which the attempts to remove obesity, or to prevent its increase in the incipient state, must be directed, are the diet, exercise, and sleep; but more especially to the first, as the source of support and increase to the body.

It is obvious, that where the stomach possesses a powerful digestive faculty, and is capable of converting into chyle every digestible part of the aliment that is taken in, and when the vessels, at the same time, take up this chyle, and deposit much fat, that the most direct method to diminish this deposition, will be to diminish the quantity of the food, or to take articles of a less nutritious quality. Celsus recommends us to take but one meal a day; and this may be partly effected, in this country, by omitting supper, or, at least, by taking no animal food at that time. At dinner, the food should be plain and lean, all poignant and stimulating sauces being dispensed with, and one dish only used: a larger proportion of vegetables than of animal food should be taken, as containing less nutriment; and, upon the same principle, weak animal broths may be much used, as tending, by their bulk, and the distension of the stomach which they occasion, to allay the uneasy sensations of appetite, without conveying much nutritious matter to the constitution. It will be always useful to attend to the old adage of the temperate, and "rise with an appetite," or, at least, cease from eating, before the sensations of satiety begin to arise, and so that no heaviness, or indisposition to active pursuits, may ensue. In a word, whoever would rid himself of the incumbrance of a corpulent habit, must reduce the nutriment which he takes as far as prudence will suggest, and his patience will enable him to submit to. The effect of such a plan, in reducing preternatural obesity, is infallible. "Any one may lose a pound of blood," says Dr. Cheyne, "take a purge, or a sweat; by dropping the great meal, or by abstaining from animal food, or fermented liquors, for four or five days, as effectually as by opening a vein, swallowing a dose of pills, or taking a sudorific bolus." "Essay on Health," p. 35. The article of drink deserves an equal consideration; and the regulation of it is of scarcely less importance. We have already seen, in the case of Bright, how much the free use of even small beer seemed to contribute to augment his corpulency; and the importance of diminishing the quantity of the drink, will be still farther apparent from the case of the miller of Billericay, which we shall mention presently. Wine, and fermented liquors, should certainly be omitted; or, if any wine is taken, it should be in small quantity, and much diluted, or the thin acid wines should be used. But water, the beverage of nature, will be generally found to be the most wholesome in such cases. The good effects of a diet, thus reduced and regulated, both in quantity and quality, were long ago illustrated by the example and precept of a noble Italian, CORNARO, who was early incumbered with a corpulent habit, but who relieved himself, and lived in health and comfort to an extreme old age, by a rigid adherence to temperance and sobriety. See his treatise *sulla vita sobria*. He restricted his diet to twelve ounces of solid food a day, which comprised one egg, and bread; and his drink to fourteen ounces, never including more than one glass of wine. It has been apprehended, indeed, that a very great change, from a highly nourishing to a weak diet, is liable to be productive of serious detriment to the constitution; but the example which we are about to quote, will shew the importance of such a change in the diet, and the extent to

which it may be carried, not only with impunity, but with the most beneficial consequences. It will supply the place of a volume on the subject.

The case, to which we allude, is that of Mr. Thomas Wood, a miller, at Billericay, in the county of Essex, which is related by sir George Baker, in the second volume of *Medical Transactions of the College of Physicians*, p. 259, et seq. Thomas Wood was born on the 30th of November, 1719, of parents who were apt to be intemperate in their manner of living, and was subject to various disorders, particularly the rheumatism, until he attained the age of thirteen years. He then had the small-pox in a favourable way; and from that time became healthy, and continued to have no complaints, to the age of about forty-three years. From his attaining the state of manhood to this period, but especially during the latter part of the time, he indulged himself, even to excess, in fat meat, of which he used to eat voraciously three times a day, together with large quantities of butter and cheese. Nor was he more cautious with respect to strong ale, which was his common drink. About his fortieth year he began to grow very fat; but, finding that he had a good appetite, and digested his food without difficulty, and that his sleep was undisturbed, he made no alteration in his diet. It was in his forty-fourth year when he first began to be disturbed in his sleep, and to complain of the heart-burn, of frequent sickness at his stomach, pain in his bowels, headache, and vertigo. He was now sometimes costive, at other times in the opposite extreme; had an almost constant thirst, a great lowness of spirits, violent rheumatism, and frequent attacks of gout. He had likewise two epileptic fits. But the symptom which appeared to him to be the most formidable, was a sense of suffocation, which often came on him, particularly after his meals. Under such a complication of diseases, every day increasing, he continued till August 1764, when the reverend Mr. Powley, a worthy clergyman in the neighbourhood, observing his very ill state of health, and the extreme corpulence of his person, recommended to him an exact regimen; and pointed out the "Life of Cornaro," as a book likely to suggest to him a salutary course of living. This book convinced him that intemperance was the cause of all his complaints; and he determined to try the effects of a change of life. At first he confined himself to one pint only of his ale every day; and used animal food sparingly. Finding this method to answer to his satisfaction, (for he felt easier and lighter, and his spirits became less oppressed,) he was encouraged to proceed; and, after having pursued this regimen during two months, he deducted half the quantity from his allowance of ale, and was still more sparing of gross animal food. In January 1765, he left off all malt liquor; and, in the following month, began to drink only water, and to eat only the lighter meats. Under this degree of abstinence, although some of his complaints were relieved, yet others remained in full force; the rheumatism tormented him, and he had, now and then, slight fits of the gout. In June 1765, he began the exercise of the dumb-bell, which he constantly persevered in. He continued to drink water only until the 25th of October in the same year; but from that time he abstained altogether from drink, (except on the 9th of May in the following year, 1766, when he drank two glasses and a half of water,) and took no liquor whatever, except what he swallowed in the form of medicine. From June 1767, he abstained from butter and cheese; and the 31st of July, in the same year, was the last time of his eating any animal flesh; his diet, from that date, being principally confined to pudding made of sea-biscuit. He allowed himself very little sleep, generally going to bed at eight o'clock in the evening, sometimes even earlier, and rising

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about one o'clock in the morning, very rarely being in bed after two.

Under this strict course of abstinence he still continued to live till the year 1783, expressing, in the highest terms, the great pleasure and tranquillity of mind which he enjoyed in consequence of it. The poor diet, to which he had accustomed himself, became as agreeable to his palate, as his former food used to be; and he had the additional satisfaction, to find his health established, his spirits lively, his sleep no longer disturbed by frightful dreams, and his strength so far improved, that he could carry a quarter of a ton weight; which weight he in vain attempted to carry when he was about the age of thirty years. His voice, which was entirely lost for several years, became clear and strong. In short, to use his own expression, he was metamorphosed from a monster, to a person of a moderate size; from the condition of an unhealthy, decrepit old man, to perfect health, and to the vigour and activity of youth. He used much exercise, his business leading him to ride a great deal on horse-back; continued the dumb-bell, and took every occasion of leisure to dig in his garden. Mr. Wood was a great enemy to all fermented liquors, to butter, and to salt; and he found that a pudding of common fermented bread was less agreeable to his stomach than one of sea-biscuit. The pudding, which was his sole support during two years, was made as follows: Three pints of skimmed milk, boiling, were poured on one pound of the best sea-biscuit, broken into pieces: This was done over night, and the ingredients were left to stand together until the following morning, when two eggs were added: This compound, being boiled in a cloth about the space of an hour, became a pudding of sufficient consistence to be cut with a knife. Of this, his quantity used to be one pound and a half, at four or five o'clock in the morning, as his breakfast, and the same at noon, as his dinner; after which, he abstained from food until the next day. But having grown fatter under this diet, he judged it necessary to quit it, as being too nutritious; and during three months he lived on the following composition, viz. one pound of coarse flour, and one pint of water, boiled together. This he was at first much pleased with; but afterwards found it disagreeable to his stomach, and not easily digestible. The pudding which he afterwards used, was composed of one pound of the flour, of which the coarse or ordinary kind of the sea-biscuit is made, boiled with a pint and half of skimmed milk, without any other addition.

Mr. Wood continued in this course of abstemiousness, lively, active, and full of strength, until the 21st of May 1783, when he died, in the sixty-fourth year of his age, of an inflammation in his bowels, by which disease his mother and brother had been carried off. A few days previous to his death, he had travelled more than sixty miles on horse-back, without any sense of fatigue.

The principal reason which led Mr. Wood to refrain from drinking, was, that it excited a desire for a larger quantity of food. Much drink operates, he said, as a provocative to eating, as salted meats and high sauces excite a desire for drinking. But, in order to be able to abstain from drinking, the food should be of a moist nature, and all dry and salted meats, and indeed every thing commonly called relishing, should be shunned. He did not mean to assert, that any animal can live without moisture; but considered eating his pudding to be the same thing as eating the quantity of dry flour, of which it was made, and drinking afterwards the quantity of water which it contained. See the sequel to the case in the 3d vol. of the Med. Transact., by the same writer.

The importance of an attention to the other two points,

which we have mentioned, namely, the use of *exercise*, and the regulation of *sleep*, are also well illustrated, in this history of unexampled perseverance in a rigid abstinence. The principal value of active exercise consists, apparently, in the increase of the natural discharges, especially of the cutaneous perspiration. The experiments of Sanctorius shew satisfactorily the extent to which the quantity of the fluids, and therefore the weight of the body, are regulated by this discharge; and the diminution of the circulating fluids, the source of the secretion of fat, necessarily implies the diminution of the secretion. Hence the obvious utility of active exercise to those, who are disposed to corpulency: such as various mechanical labours, digging, threshing, &c. or long continued walking, as taking a pedestrian tour. And let it be observed, since the abstract considerations of reason alone, seldom conquer the alluring suggestions of appetite and indolence, that the rich man, who fares sumptuously every day, eats his viands of luxury with less real gratification, than the labourer his coarse and uninviting meal. This will be fully conceded by all who have made the experiment, by a walk of a few hundred miles. Such is the benevolence of nature in equalizing the happiness of mankind!—*Beati, sua si bona norint.* See EXERCISE.

Moderation in the quantity of sleep is not less necessary than abstinence and exercise, with a view to the removal or prevention of corpulency. Much sleep implies much inaction, and inaction leads to an accumulation of fluids in the body, and the consequent deposition of fat, in habits predisposed to that secretion. It is impossible to recommend any certain portion of time, which ought to be devoted to sleep, since this must depend upon the peculiarities of individual constitution, as well as of age, &c. For an adult person, of ordinary strength, seven hours, we apprehend, will afford ample restoration of the powers, exhausted during the activity of the day. See SLEEP.

Where urgent morbid symptoms arise from corpulency, or where the rules of temperance and exercise are not submitted to, relief may be given by producing evacuations by artificial means, as by directly emptying the blood-vessels by means of the lancet, or cupping; or indirectly by the use of cathartic medicines, which produce a great discharge of fluids into and through the intestines. But when either of these operations has been frequently repeated, the constitution becomes habituated to them, and actually produces an increased supply of fluids, to compensate the loss; so that evacuations must also be habitually repeated, or a dangerous plethora may ensue. A regular discharge from the bowels is most safely promoted by means of diet: as by the free use of the subacid fruits, either fresh, or preserved with sugar; by the use of coarse bread, instead of that which is fine, &c.

Dr. Flemyng recommended strongly the use of soap, as a diuretic, for the reduction of corpulency, and relates a case, in which the soap, given first in the dose of a drachm once a day, increased gradually to two, three, or even four drachms, and continued for three or four months, effectually removed the accumulation of fat, and its consequences. Whether it operated by increasing the secretion of urine, or, like the vegetable acids, when freely used, by impeding the work of digestion, it may not be easy to determine. But we should apprehend that considerable danger to the constitution might accrue, from the continued use of any medicine, which must act either by morbidly increasing the functions of one organ, or diminishing those of another; and therefore conclude that the regulation of the diet, exercise, and sleep, affords the safest, as well as the most effectual antidote to corpulency. See Dr. Flemyng's pamphlet on Corpulency. See also Cullen,

len. first lines, § 1621, *et seq.*—Sauvages, Nosol. Meth. class 10. Gen. Polyfarciæ.

CORPUS, *body*, in *Anatomy*, is applied to several parts in the animal structure; as *corpus callosum*, *corpus glandulosum*, *corpus reticulare*, &c.

CORPUS callosum, is a part of the brain. See **BRAIN**.

CORPUS cavernosum urethrae. See **CAVERNOSUM**.

CORPUS ciliare, is a term, which includes the anterior part of the choroid coat with all the folds, that connect it to the vitreous humor. See **EYE**.

CORPUS luteum. The *corpora lutea* are oblong bodies, of a yellowish colour, and glandular structure, only discernible in the ovaria of animals when pregnant. They are supposed to be the calyces, containing the ova. The number of them, therefore, is equal to the number of ova, contained in the ovaria. The corpus luteum is extremely vascular, but the vessels are inconspicuous, until one or more ova become impregnated, when they are enlarged. On the ovum detaching itself, and falling into one of the fallopian tubes, the corpus luteum, or calyx, withers and decays, a cicatrix only remaining, on its upper or most prominent part, whence the ovum had escaped. Its office is to nourish the ovum, or it is the medium through which the nourishment passes to the ovum, until it is fitted to be transmitted to the uterus. That it performs this office appears from hence, there are always as many corpora lutea visible, as there are ova in the ovaria or fœtuses in the uterus. See Denman's Introduction to the Practice of Midwifery. This subject will be again noticed under the word *ovarium*.

CORPUS pampiniforme, is a venous plexus, formed by the veins of the testis. See **GENERATION**, *organs of*.

CORPUS spongiosum urethrae; the vascular substance, which surrounds the urethra of the male sex from its membranous part to its termination. See **GENERATION**, *organs of*.

CORPUS is also used in matters of learning, for several works of the same nature, collected, and bound together.

Of this kind is the *corpus juris canonici*, or body of the Roman canon law. See **CANON LAW**.

The *Corpus juris civilis*, or body of the civil law, is composed of the digest, code, novels, and institutes. See **CIVIL LAW**; see also **CODES**, **DIGEST**, &c.

We have also a *corpus* of the Greek poets; and another of the Latin poets. See **BODY**.

CORPUS-Christi day, a feast held always on the next Thursday after Trinity Sunday. It was instituted in the year 1264, in honour of the blessed sacrament, to which also a college in Oxford is dedicated. We find it mentioned in 32 Hen. VIII. cap. 21. By which statute Trinity-term is appointed for ever to begin the morrow after this feast. See **TERM**.

CORPUS cum causa, in *Law*, a writ issuing out of chancery, to remove both the body, and record, touching the cause of any man lying in execution upon a judgment for debt, into the king's bench, &c. there to lie till he has satisfied the judgment. F. N. B. 251. See **HABEAS CORPUS**.

CORPUS cepi. See **CEPI**.

CORPUS habeas. See **HABEAS**.

CORPUSANSE, in *Meteorology*, a name given by mariners, to those luminous bodies, which, in thick hazy weather, skip about the masts and yards of ships; and which were the *Castor* and *Pollux* of the Ancients. Corpufanse is a corruption of *Cuerpo Santo*, as this meteor is called by the Spaniards. Phn. l. ii. c. 37.

CORPUSCLE, (from the Latin *corpusculum*;) a very small body. But large and small being relative terms, it is evident that the very same body is said to be large when com-

pared with a smaller, and small when compared with a larger body. By the word *corpuscule*, however, in philosophy, is mostly meant one of the elementary, or of the minutest, particles of a body; a physical atom. And here it is necessary to remark, that the exact meaning of the word is far from being determined or understood. By some philosophers the corpuscules are said to be those elementary components of a body, which cannot be divided into smaller parts; but it is not in our power to assert whether such indivisible particles do, or do not, exist. According to others, by the word *corpuscules* are meant not the elementary particles; but such, whether of a simple or a compound nature, as cannot be dissolved nor dissipated by the action of an ordinary heat. But this meaning likewise is indefinite and equivocal.

The various opinions of philosophers respecting the constitution of matter are all hypotheticalal, generally obscure, and often absurd; nor does it appear, that the present state of philosophical knowledge affords data sufficient for investigating the nature of the elementary parts of bodies. Leucippus and Democritus imagined that the component atoms or corpuscules of bodies were of different unalterable forms; that they were continually in motion; and that they were susceptible of a variety of arrangements. Epicurus attributed to the atoms an innate power of mutually affecting each other's motions, and a power of forming all the various natural bodies, according to their different spontaneous arrangements. Des Cartes supposed, that there existed atoms of different forms, and that these possessed no other property besides extension; deriving all their other qualities from the agency of an ethereal fluid infinitely elastic. Other philosophers have supposed that what appears to us as body or matter, is nothing more than an assemblage of properties, such as resistance, opacity, &c. for they say, the idea we have of a body before us, is something which obstructs the sight, or hinders the motion of our hands, &c. therefore we ought to conclude that the object we perceive is nothing more than an assemblage of those properties by which it is rendered manifest to our senses. In short, the real constitution of matter, and of its ultimate elementary components, is so far removed from the gross apprehension of our senses, and even of our reasoning faculty, as not to admit the formation of a true, or at least a plausible theory. Therefore the word *corpuscule* must be allowed to remain an expression of a relative nature. See **MATTER**.

CORPUSCULAR ATTRACTION, denotes that power by which the minute component particles of bodies are united, and adhere to each other. It may be distinguished into *attraction of aggregation*; viz. that power by which the *homogeneous* particles of bodies are united; and *attraction of affinity or of composition*, viz. that power by which the *heterogeneous* particles of bodies are united.

The phenomena of aggregation may be said to comprehend the greatest part of the operations of nature. The various consistencies of bodies, the yielding softness of some, the rigid hardness of others, the crystallization or regular configuration of several substances, the various appearances which are often assumed by the same body under different circumstances, &c. are all depending upon the different degrees of that power, whatever it be, by which the particles of bodies tend towards each other. But though the effects of that power fall continually under the cognizance of our senses; though the formation of the parts of our bodies in their different state of consistency, tenacity, &c. and though the fabric of the universe, depend almost entirely upon it; yet we must reluctantly acknowledge our ignorance of its nature. And whilst we endeavour to investigate, and to ascertain the laws under which it acts, so as to apply the same

to our wants; we must consider the power itself as an original and innate property of matter.

That the celestial bodies, at least those which belong to our solar system, are kept in their orbits at proper or proportionate distances from each other, by the general power of attraction, otherwise called universal gravitation, has been proved by sir Isaac Newton, who has shewn that all the planetary movements are strictly conformable to the laws of that gravitating power, which is proportionate to the quantity of matter, and the action of which decreases inversely as the squares of the distances. But the cohesion of the particles of bodies cannot be attributed to the same power; first, because it is exceedingly powerful at certain distances, or rather in close contact, and, instead of decreasing regularly, it vanishes on the least separation; and, secondly, because it differs in different bodies. A diamond, for instance, is incomparably harder than a piece of gold, *viz.* its particles adhere to each other with much greater force than those of gold; nor does that attractive power seem to accompany any of the other sensible qualities of the bodies, *viz.* neither their specific gravity, nor transparency, nor other property, seems to be concerned with it. The sudden decrease of that power is a very remarkable circumstance; for instance, a piece of glass, or steel, or stone, or any other hard substance, when once broken, if the fractured parts are again placed contiguous to each other, no adhesion takes place.

The principal phenomena relative to the attraction of aggregation are as follow. 1st. Its power is different in different bodies; *viz.* the particles of one sort of matter adhere to each other with much greater force, than those of another sort of matter; the gradation being infinite. 2dly. In the formation of a body from deposition; *viz.* when the particles of a certain substance are deposited from their solution in water or other fluid menstruum, (for by this means several stones, salts, &c. are formed into solids of considerable bulks,) it has been observed, that the aggregate, or body, resulting therefrom is harder, and more regular in shape, when the deposition has been performed gradually during a considerable length of time, when the particles were finer, and the solution more perfect, than with the reverse of those circumstances; *viz.* the compound is softer and less regular when the solution contained grosser particles of that substance, and the deposition was quickly performed. 3dly. When the bodies are rendered solid after their fusion by heat, sometimes the foregoing results take place; but at other times the bodies acquire a remarkable degree of hardness in consequence of a sudden cooling, and a consequent sudden transition from the fluid into the solid state; whereas they remain much softer if they are suffered to cool and to harden slowly. 4thly. The attraction of aggregation is counteracted by the attraction or the affinity of composition, and by heat. We shall now subjoin a few necessary remarks, and shall briefly state certain facts, which belong to the abovementioned phenomena.

1st. The different degrees of hardness which bodies are possessed of, is not entirely depending upon the peculiar attraction of the homogeneous particles, but is in great measure to be attributed to the admixture of heterogeneous particles of matter, for even the simplest bodies which occur to us in the common affairs of life, are far from being divested of all extraneous matter. But taking bodies such as are commonly presented to our senses, and without inquiring whether they are simple or compound, several species of hardness ought to be discriminated, as being of great consequence in the arts, and especially in mechanics. The principal of these are, the *tenacity*, the *brittleness* or *rigidity*, and the *elasticity*. See the nature of those species of hardness under their various appellations.

2dly. The depositions of earthy or saline matters from their solutions in water and other menstua, whence stony concretions, petrifications, crystallized salts, and such like aggregates are formed, have been commonly observed to be much more compact and regular when the process has been performed during a considerable length of time, than when quickly. Thus certain waters after having been kept in a glass or bottle a few hours, and even after a few minutes, deposit a considerable quantity of earthy matter; but that matter, so quickly deposited, generally, if not always, is in a loose powdery state; whereas the very hard incrustations are formed by the very slow deposition of the minutest particles. Thus also let a saline solution be evaporated quickly, and the salt will be deposited in a shapeless and powdery state; but if the evaporation be suffered to proceed slowly, as by the mere exposure of the solution to the atmosphere in an open vessel, then the salt will be concreted in the form of crystals, possessing a regularity of form, and a considerable degree of hardness. With respect to the form, it is farther to be remarked that almost every species of matter, when the formation of it is suffered to proceed slowly, assumes a certain shape, or arranges its particles in a certain order, peculiar to itself. Now these facts seem clearly to point out a kind of polarity in the particles of matter, which is somewhat analogous to the magnetic polarity; *viz.* that a particle of matter does not attract another particle on every side indiscriminately; but that one particle attracts another with one side and repels it with another side; like two magnets, the homogeneous poles of which repel, and the heterogeneous, (that is, a south and a north pole,) attract each other. Upon this principle the above mentioned phenomena of depositions are easily explained; for when the deposition proceeds gradually, the particles of matter have time and liberty to turn their friendly poles or extremities towards each other, in consequence of which they form a compact and hard body; but when the deposition is performed suddenly, the repellent extremities of the particles of matter, as well as their attractive ends, fall confusedly, and of course no hardness of aggregate will be obtained. The science of electricity offers another instance of two powers attractive of each other, but each repulsive of its like; *viz.* two bodies both possessed of the same kind of electricity, (be it vitreous or resinous, plus or minus,) will repel each other. But when one of the bodies is electrified positively, and the other negatively, then the two bodies will attract each other. But in attributing a sort of polarity to each particle of matter, we would not be understood to assert, that they are either magnetic or electrical; on the contrary it appears that their attractive power is of a very different nature; and we only wish to shew that such difference or peculiarity does exist, and that the attraction of the particles of one sort of matter is in some way or other different from the attraction of the particles of a different substance; otherwise the different forms of their crystals or configurations could not possibly take place. We may, for instance, suppose that the particles of a certain body are oblong, and that one extremity of one particle attracts one extremity of another particle, or we may suppose that the middle of one particle attracts the extremity of another. We may also suppose that the shape of the particles of one kind of matter is different from the shape of others; some for instance, may be globular, whilst others are cylindrical, others angular, and so forth. But with respect to this, nothing certain is known.

3dly. Though the fusion of substances by heat may be considered as a solution of the substances in that element; yet

yet the effects which arise therefrom cannot be entirely reconciled to the above-mentioned phenomena of solution; and indeed the former frequently appear to follow a law diametrically opposite to that of the latter. The peculiar circumstance is, that, by cooling suddenly, most substances become much harder than when they are slowly cooled and rendered solid; so that if the hardening of the body after fusion be considered as a deposition from the element of heat, the effect is by no means similar to that of the depositions from water and other fluid menstrua. It is, however, to be remarked that the superior degree of hardening of substances when quickly cooled, depends, in great measure, if not entirely, upon a mechanical circumstance, which is, that the external parts of the body are suddenly hardened whilst their internal parts are yet fluid, or much expanded; so that the former will not adjust their figure to the latter when these are afterwards rendered solid and compact; hence the whole aggregate remains in a state of tension, upon which the peculiar degree of hardness seems to depend. What particularly corroborates this supposition is, that a body hardened by sudden cooling, is larger in its dimensions, than when cooled slowly. Mr. Cavallo, in the 2d vol. of his Nat. Phil. p. 77. mentions a very remarkable instance of this kind. Mr. Rt. Pennington, he says, measured a piece of steel in its soft state, and found it 2,769 inches in length. After hardening by plunging it, when red-hot, in cold water, the same piece was found to measure 2,7785 inches; and when let down, or softened, to a blue temper, it measured 2,768 inches. See the article

CONTRACTION.

4thly. The attraction of aggregation is counteracted by the attraction or affinity of composition. In other words, the mutual attraction of the homogeneous particles of bodies, is diminished by the attraction between the heterogeneous particles of matter; and the action of the former is inversely as that of the latter. Thus the component particles of a metallic body form a very compact aggregate in virtue of their mutual attraction: but if the metal be placed in an acid menstruum, then the particles of the metal are separated, because the attraction between them and the acid is stronger than their own mutual attraction.

Heat likewise separates the particles of bodies; a metallic substance, for instance, is fused by heat; but the solution in a menstruum is on various accounts different from the solution, or fusion, by heat; we must, however, refer the farther discussion of the subject to other articles. See AFFINITY, CRYSTALLIZATION, FUSION, and SOLUTION.

CORPUSCULAR PHILOSOPHY, that scheme or system of physics, wherein the phenomena of bodies are accounted for, from the motion, rest, position, arrangement, &c. of the minute corpuscles, or atoms, whereof bodies are composed.

The corpuscular philosophy, which now flourishes under the title of the *mechanical philosophy*, is exceedingly ancient. Leucippus and Democritus were the first who taught it in Greece; from them Epicurus received it, and improved it, inasmuch that it came at length to be denominated from him, and was called the *Epicurean philosophy*.

Leucippus, again, is said to have received it from Mochus, a Phœnician physiologist, before the time of the Trojan war, and the first who philosophized about atoms: though Gale, who borrows all profane philosophy from the sacred philosophy in the books of Moses, is of opinion that he might take the hint from the Mosaic his-

tory of the formation of man out of the dust of the earth.

Indeed, Casaubon takes *Μοχος*, or *Μοχος*, to be the name of a Tyrian, who among his own countrymen was called *מֹשֶׁה*, *Mofche*, or according to the method of writing which then obtained. Moses: whence it is conjectured that the *Mofche*, or *Mofchus* of the Tyrians, was, in effect, the Moses of the Hebrews.

This appears to be the sentiment of Selden, Arcerius, &c. But the opinion of Bochart is more probable, who, from Posidonius and others, takes Mochus for an inhabitant of Sidon, and his philosophy to be nothing else but a physiological or natural history of the creation.

After Epicurus, the corpuscular philosophy gave way to the peripatetic, which became the popular system.

Thus, in lieu of atoms, were introduced specific and substantial forms, qualities, sympathies, &c. which amused the world, till Gassendus, Charleton, Des Cartes, Boyle, Newton, and others, retrieved the old corpuscularian hypothesis; which is now become the basis of the mechanical, and experimental philosophy. See ATOMIC PHILOSOPHY.

Mr. Boyle reduces the principles of the *corpuscular philosophy* to the four following heads.

1. That there is but one catholic, or universal matter, which is an extended, impenetrable, and divisible substance, common to all bodies, and capable of all forms.

This sir Isaac Newton improves upon in the following manner: "All things considered, says that great author, it appears probable to me, that God, in the beginning, created matter in solid, hard, impenetrable, moveable particles; of such sizes and figures, and with such other properties, as most conduced to the end for which he formed them: and that these primitive particles, being solids, are incomparably harder than any of the sensible porous bodies compounded of them; even so hard as never to wear, or break in pieces: no other power being able to divide what God made one in the first creation. While the corpuscles remain entire, they may compose bodies of one and the same nature and texture in all ages: but should they wear away, or break in pieces, the nature of things depending on them would be changed: water and earth, composed of old-worn particles, would not be of the same nature and texture now, with water and earth composed of entire particles at 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, of these permanent corpuscles."

2. That this matter, in order to form the vast variety of natural bodies, must have motion in some, or all its assignable parts; and that this motion was given to matter by God, the creator of all things; and has all manner of directions and tendencies.

These corpuscles, says sir Isaac Newton, have not only a vis inertiz, accompanied with such passive laws of motion as naturally result from that force; but also are moved by certain active principles; such as that of gravity, and that which causes fermentation, and the cohesion of bodies."

4. That these differently sized and shaped particles have different orders, positions, situations and postures, from whence all the variety of compound bodies arises.

CORRA, in *Geography*, a town of Persia, in the province of Segestan, on the lake Zare: 15 miles S.E. of Kin.—Also, a river of Persia which runs into the lake Zare, near the town of Corra.

CORRAAN, a peninsula of Ireland on the west coast

of the county of Mayo, separated from Achil island by a narrow channel. It is in old maps, and even in some modern ones, erroneously represented as an island. It is about seven miles from east to west, and from two to four miles wide. The country is mountainous and very thinly inhabited. See BURRISHOOLE.

CORRADINI DE SEZZA, PETER MARCELLINUS. in *Biography*, was intended for the study of the law, and became, in that profession, so distinguished as to attract the notice of pope Clement XI. who appointed him to honourable and confidential offices. Disgusted, however, by the intrigues of the court, he gave himself up to retirement, for the purpose of applying to literary pursuits. Here he remained till he was created cardinal by pope Innocent XIII. This dignity he enjoyed more than 20 years, and died at Rome in the year 1743, having attained to his 83d year. This cardinal was author of a learned and curious work, entitled "Vetus Latium, profanum et sacrum," in two vols. folio: likewise of a history of his native place, entitled "De civitate et ecclesia Settina." He is said to have written other works under assumed names.

CORRÆA, in *Botany, Sm. Trans of Linn. Soc. v. 4. 219. Willd. v. 2. 324.* Class and Order, *Ocandria Monogynia.* Nat. Ord. *Rutaceæ*, Juss.

Named by Dr. Smith in honour of Joseph Correa de Serra, LL.D. F.R.S. F.L.S., a learned Portuguese botanist, late secretary to the Academy of Sciences at Lisbon, and chief director of that body under the auspices of its illustrious president the late duke of Lafoens, who was always warmly attached to Mr. Correa, under various difficulties and contrarieties to which his sense and liberality exposed him in that bigotted country. After a residence of some years in England, where he obtained and deserved the esteem of all the most distinguished naturalists, he is now cultivating his favourite science at Paris. See *Sm. Exot. Bot. t. 72, and Tour on the Continent, ed. 2. v. 1. 357. and v. 3. 123.*

This same genus has received the hard name of *Mazentoxeron* from M. la Billardiere; but fortunately long after it was published, unknown to him, by the Linnæan Society. Mr. Correa had indeed already received the honour of a genus from his countryman Vandelli, but it proves to be a species of *Ochna*.

Gen. Ch. *Cal.* of one leaf, bell-shaped, regular, with four teeth, inferior, permanent. *Cor.* regular: Petals four, linear-oblong, cohering longitudinally, externally clothed with starry pubescence; spreading at their summits, and obtuse. *Stam.* Filaments eight, awl-shaped, smooth, dilated towards the bottom, four of them somewhat longer than the rest. Anthers sessile, incumbent, oblong, of two cells, bursting longitudinally, without any appendage. *Pist.* Germen superior, bristly, four-lobed. Style thread-shaped, about as long as the stamens, smooth. Stigma in four small acute lobes. *Capsules* four, cohering longitudinally, coriaceous, each lined with an elastic arillus. *Seeds* two in each capsule, back, kidney-shaped.

The fruit, which we have but lately known in perfection, proves this genus to belong to the *Rutaceæ*, not the *Rhododendra*, of Jussieu, and its essential character requires correction.

Ess. Ch. *Calyx* of one leaf. *Petals* four, cohering. *Anthers* incumbent, simple, two-celled, bursting longitudinally. *Capsules* four, cohering, each lined with an elastic arillus.

Sp. 1. *C. alba.* White-flowered *Corræa.* *Willd. Sp. Pl. v. 2. 324. Andr. Repoj. t. 18. (Mazentoxeron rufum. Billard. Voy. t. 17.)* Leaves roundish, even, entire. Flowers erect.—A shrub four or five feet high, much branched;

the branches opposite, downy and white. Leaves opposite, on short and broadish white footstalks, of a roundish elliptical obtuse form, entire, even, not undulated, single ribbed; green, but sprinkled with minute dots of white starry deciduous pubescence above; very white beneath, and clothed with dense pubescence, which, like that of the whole genus, consists of closely entangled starry or clustered hairs. Stipules none. Flowers terminating the small branches, solitary, or two or three together, on shortish stalks, upright, white. Calyx very obscurely four-toothed. Petals four times as long as the calyx, cohering when young, then spreading into a funnel shaped flower. Stamens rather shorter than the petals, with red anthers. The petals, calyx and flower-stalk are all clothed with the same white starry pubescence as the backs of the leaves, which when for some time dried, turns of a rusty hue; and this must account for Billardiere's specific name, his description having apparently been made from dried specimens after his return home. This plant is a native of New South Wales near Port Jackson. It was originally found by sir Joseph Banks and Dr. Solander. We first saw it growing at Messrs. Lee and Kennedy's, Hammer-smith, flowering in May and June. It is a hardy green-house shrub, propagated by seeds or cuttings, requiring peat earth, and regular supplies of water.

2. *C. virens.* Green-flowered *Corræa.* *Sm. Exot. Bot. v. 2. 25. t. 72. (C. viridiflora. Andr. Repoj. t. 436,* with an erroneous reference to Billardiere; see the preceding species. This seems his *Mazentoxeron reflexum, t. 19.)* Leaves oblong, undulated; heart-shaped at the base. Flowers pendulous. Calyx-teeth elongated.—A taller shrub than the foregoing, which first flowered at the marquis of Blandford's at White Knight's, Berks, the seeds having been sent from New South Wales. It thrives well under a warm wall in the open air with a little covering in winter, and flowers in the autumn. The branches are numerous, divaricated and forked, clothed when young with clustered rusty pubescence. Leaves on short stalks, reflexed, oblong, bluntish, veiny; heart-shaped at the base; undulated and somewhat revolute at the margin; green, dotted and roughish above; densely pubescent and whitish beneath. Flowers terminal or axillary, solitary, pendulous, with a pair of narrow bractæ a little below the base of the calyx. Calyx-teeth very perceptibly elongated, linear. Corolla cylindrical, the petals cohering strongly, except at the base and summit, all over downy and of a pale green. Stamens longer than the corolla. Capsules white, hairy. Seeds black. It varies with trifid as well as quinquefid flowers, but its natural and general structure is quadrid, like the other species. The flowers are without smell, as far as we have been able to observe, but their aspect is singular and elegant.

3. *C. rubra.* Red flowered *Corræa.* *Banks Ic. ined. apud Bibl. Linn.* Leaves oblong, undulated; somewhat heart-shaped at the base. Flowers ascending. Calyx-teeth obsolete.—This has so much of the habit and general structure of *C. virens*, that it is difficult to detect a specific difference. The leaves indeed are more commonly ovate than heart-shaped at their base, though variable in this respect; the flowers grow rather upright than pendulous, and their calyx is almost perfectly even at the edge, with scarcely any rudiments of teeth, and nothing like the linear elongations observable in the last, which form its most decisive character. The plant however is chiefly remarkable for the crimson hue of the corolla, which, contrasted with its green extremities, renders this one of the handsomest New Holland shrubs, and it is to be regretted, that though dried specimens have been brought from its native country, no seeds have vegetated in

our gardens. The flower-buds and their cups look exactly like small acorns, and we have known them gathered for the seeds. Sir J. Banks and Dr. Solander first discovered this species. S.

CORRECTED CALENDAR. See CALENDAR.

CORRECTION, or CHASTISEMENT, in the Manage, denotes any method that is used to awe or punish a horse, when he disobey; and is distinguished from *aide*, which signifies any means that are used to assist or direct a horse, and that enable him to execute whatever he is put to do. Accordingly, aids seem to prevent, and corrections to punish, whatever faults a horse may commit. See AID. Corrections are of two sorts: you may punish your horse with the fours, the switch, or chambriere; you may punish him by keeping him in a greater degree of subjection: but in all these cases, a real horseman will endeavour rather to work upon the understanding of the creature, than upon the different parts of his body; for a horse has imagination, courage, and real judgment, which three faculties, duly regarded, will be likely to ensure success. The corrections, which reduce a horse to the greatest obedience, and that dishearten him the least, are such as are not severe; but such as oppose and thwart the horse consist in thwarting him in what he wants to do, by restraining and putting him to do directly the contrary. If your horse do not advance or go off readily, or if he is sluggish, make him go sideways, sometimes to one hand, sometimes to the other, and drive him forward, and so alternately. If he goes forward too fast, being extremely quick of feeling, moderate your aids, and make him go backward some steps; if he presses forward with hurry and violence, make him go backward a great deal. If he is disorderly and turbulent, walk him straight forward, with his head in and croupe out. These sorts of correction have great influence on most horses.

But with horses of an obstinate and rebellious disposition, correction of a more severe kind may be necessary; and yet in the use of it requires great prudence and management. The spurs, properly applied, are of considerable service in aweing and correcting the animal; but when used improperly, they make the horse abject and jadish, restive and vicious. The horseman should not, therefore, be too hasty in applying this correction. To give the horse both spurs properly, you must change the posture of your legs, and, bending your knee, strike him with them at once as quick and as firmly as you can. Take care never to open your thighs and legs, in order to give both spurs; for the action, becoming thus irregular, could never produce a good effect. The chambriere, as a correction, should be used with discretion; and the switch is not often employed for punishment. Berenger's Hist. and Art of Horsemanship, vol. ii. ch. 9. See AID.

CORRECTION, in Pharmacy. This word has several peculiar senses: and first, drastic medicines, or such as operate with violence, are said to be corrected, when in their composition some ingredient is added, which proves a kind of check to the operation, or prevents those misfortunes which they generally bring, without such correcting ingredient. Thus, for instance, some carminatives, as the seeds of fenel or anise, are added to senna leaves, which, when exhibited alone, generally excite flatulencies and gripes. The substances or ingredients thus added, with an intention to render the medicines more safe, are called *correctoria*, or *correctoria*, *castigantia*, or *infringentia*. Secondly, medicines which operate in a slow and laud manner, are said to be corrected, when they are so prepared as to accelerate or augment their operation: when, for instance, salts are mixed with evacuating medicines of a gummous or resinous nature,

that by means of being more resolved or attenuated, they may operate more powerfully. With this intention salt of tartar, or *sal polychrestus*, is added to infusions of senna. Ingredients added with this view are called *adjuvantia*; and when more drastic substances of the same virtues are added, in order to augment the operation of the compositions, these are called *acuentia*. Thirdly, nauseous and ungrateful medicines are said to be corrected, when they are prepared in such manner as to be more agreeable and acceptable to the palate. James.

CORRECTION, in Printing, the act of retrenching the faults in a work, or the reading, which the corrector gives the first proofs, to point out and amend the faults, to be rectified by the compositor.

The corrections are placed on the margin of each page, right against the line where the faults are found. There are different characters used to express different corrections, as D or *d. dele*, for any thing to be effaced, or left out. When any thing is to be inserted, the place is marked in the line with a caret \wedge , and the insertion added in the margin. When a word, syllable, &c. is to be altered, it is erased out of the proof, and that to be put in its room written in the margin; always observing, if there be several mistakes in the same line, that the corrections in the margin be separated by little bars, or strokes, |. If a space be omitted, its place is marked with a caret, and the margin with \times . If a space be wrong placed, as in the middle of a word, the two parts are connected with a curve, and the same character put in

the margin. If a letter be inverted, it is expressed on the margin with J . If any thing be transposed, it is marked thus: *The shortest | are the | follies | best*; for *the shortest follies are the best*; and in the margin is added *tr.* in a circle. If Roman characters are to be changed for Italic, or *vice versa*, a line is drawn under them thus, and *Roman* or *Italic* added in the margin; if to capitals, a double line. If a word or sentence is entirely omitted, the place is marked with a caret, and in the margin is inserted the word *out*. If the letters of a word stand too far asunder, a line is drawn under them, and in the margin is put a crooked line, or hook, thus \smile .

CORRECTION, in Rhetoric. See EPANORTHOSIS.

CORRECTION of Apprentices, in Law. See APPRENTICE.

CORRECTION of Children. See PARENT.

CORRECTION of Scholars. See SCHOOLMASTER.

CORRECTION of Servants. See SERVANT.

CORRECTION of Wife. See COVERTURE.

CORRECTION, House of. See HOUSE of Correction.

CORRECTOR of the Staple, an officer, or clerk, belonging to the staple, who makes and records the bargains of merchants there made, anno 27 Edw. III. stat. 2. cap. 22, 23. The Romans called them *mensarii*.

CORRECTORS, in Pharmacy, such ingredients in a composition as guard against, or abate, the force, or dangerous qualities, of others. See CORRECTION.

CORREDIUM. See CORODY.

CORREGA, in Geography, a town of Portugal, in the province of Estremadura; 10 miles N.N.E. of Peniche.

CORREGGIO, or COREGGIO, DA, ANTONIO, in Biography, an Italian painter of the first eminence. The family name of this distinguished genius was Allegri, being called Correggio from a small city in the state of Parma, which gave him birth in the year 1494. Upon this point, as well as the period of his death, authors are pretty well agreed; but the other circumstances of his life are wrapped in doubt and conjecture.

Giorgio Vasari, the first biographer of the painters, commiserates the fate of this divine artist, whom he represents of a melancholy turn of mind, timid and diffident of his own powers, burthened with a numerous family, which, with all his prodigious talents, he could scarcely support; ill recompensed for his works: and terminates the sad story by informing us, that, having received at Parma a payment of sixty crowns in copper money, he caught a fever, in the exertion of carrying it home on his shoulders, which occasioned his death.

Whoever compares the moderate sums Correggio received for his principal works, with the magnificent rewards heaped upon Raffaele, Tiziano, and Buonaroti, nay, even upon Vasari himself, cannot feel surprized that the Florentine historian should thus lament the untoward fortune of the great Lombard artist. The picture, however, is exaggerated, and, upon investigation, it must clearly appear, that the situation of Correggio, though far beneath his merits, was in no-wise deplorable. The family of Allegri was highly respectable, and possessed considerable landed property, which is said to have been augmented by the earnings of Antonio; and, so far from his having died of the fatigue of bearing home the copper money, he was usually paid in gold, as appears from existing documents. For the Cupola and Tribuna of the church of St. Giovanni, he received 472 sequins; for that of the Duomo, 350, payments by no means inconsiderable in those times. For his celebrated *Notte* he had 40 sequins; for the St. Jerome, which cost him six months labour, 47, besides his board during that period: but when from these sums we deduct the expence of his models and colours, which were ever of the best quality, it cannot appear probable that he acquired great riches; and, we may conclude, that screened from the evils alike attendant on penury and affluence, he enjoyed the enviable situation described in the prayer of Agur the son of Jakeh. It is a tradition, in Correggio, that our young student acquired the first rudiments of his art, from an uncle named Lorenzo; he afterwards, according to Vedriani, in his "Lives of the Modenese Painters," frequented the school of Francesco Bianchi, called *Il Frari*, at Modena; there he acquired that practice in modelling so advantageous to a painter, and for which the Modenese artists were so celebrated, and there he is said to have formed a friendship with Ant. Begarelli, whose admirable works in that way drew the highest eulogiums from the great Michelangelo. After this period, we are informed, that he visited Mantua, and became the disciple of Andrea Mantegna; this could not, however, have been the case, as Mantegna died in 1506, though there is great reason to suppose, that the fine works of that ancient artist contributed not a little to accelerate the progress of Antonio's studies. Some assert, that Antonio was not the scholar of Andrea, but of Francesco Mantegna his son, an artist of no mean talents, and who was much employed in Mantua after his father's death: the abbe Lanzi seems to subscribe to this opinion, and mentions several juvenile productions of Correggio there remaining, wherein the germs of future excellence appear, blended with somewhat of the rigid style of the old school.

It has been supposed by some writers, that Correggio, instigated by the desire of beholding the Frescoes of Raffaele in the Vatican, visited Rome; and, we are told, that after having long gazed on those celebrated works, conscious of his own transcendent but less regarded talents, he broke forth into the memorable words, "anch' io son Pittore!"—"I also am a painter!"—But Lanzi, who has taken great pains in the investigation, is of opinion, that the story has no foundation, and that Antonio never saw Rome.

It would exceed our limits to enumerate any more than the principal works of this divine artist: his earliest picture of note was painted in 1512, at the age of eighteen; in it is represented, the Madonna seated on a throne, with on each side St. Anthony and St. Francis; even in this production, the dawning genius and native grace of Correggio appear, though it possesses little of that breadth of effect which afterwards so eminently distinguished his works; he advanced, however, with giant strides, for we find that in 1518, or 1519, when he painted in the monastery of St. Paolo at Parma, a room in fresco, with poetical devices, cupids, &c., he had sufficiently established himself in that novel, beautiful, and luxuriant style, which became the never equalled model of the artists of Lombardy, and the admiration of succeeding ages; but his greatest works in fresco are, the Cupola of the church of St. Giovanni, and the Duomo, in the last mentioned city; in the former cupola, which, together with the tribuna, since demolished, was executed from about 1520 to 1524, Correggio represented the Ascension of Christ, surrounded by the Apostles, who, seated on clouds, supported by the Angelic Host, regard the Saviour. The boldness of the foreshortening in this work, the grand style of drawing, the elevation of character in the heads, added to an astonishing breadth of light and shadow, rendered it a miracle in the art hitherto unexampled; the tremendous Last Judgment of Michelangelo, not having been executed till many years afterwards. So wonderful a production could only be supported by the artist himself, who, in 1530, completed his matchless work in the Cupola of the Duomo; here the Madonna, in an attitude the most exquisitely expressive of devotion and beatitude, rises majestic amidst myriads of saints and angels, who, vying with each other, in their demonstrations of joy at the arrival of the virgin mother of Christ, strike the lute, blow the loud trumpet, or join in the mazes of the celestial dance; whilst below, are introduced, as usual, the Apostles, who, with the most dignified expressions of awe and astonishment, behold her assumption; and here we must observe, that if the great Michelangelo, in the gloom of his stupendous last judgment, has reached the summit of the *terribile via*, Correggio has, in the radiant splendour of his work, touched the pinnacle of that sublime which arises from the contemplation of the more consoling attributes of the Divine nature, love and joy. Of the altar pieces, and smaller works of this master, the following are amongst the most celebrated: the Madonna, with St. George, and other figures, in the gallery of Dresden, where the little angels are so beautifully introduced, playing with the helmet and sword of the Christian Hero: the famous *Notte*, or adoration of the Shepherds, in the same collection, where the most striking effect is produced by the principal light being made to proceed from the child; a most exquisite idea, in which Correggio has been followed, though at an humble distance, by almost every painter who has since treated the subject: the Magdalen, in the desert reading, a very small picture, well worthy the magnificent frame set with jewels which surround it: the celebrated Madonna, with St. Jerome, and the Magdalen; which latter figure, in point of grace, stands unrivalled in modern art; this picture is now in the Louvre at Paris. But a volume would not be sufficient to point out—the beauties scattered with so lavish a hand throughout the works of Correggio; and when we contemplate the hard and dry manner of painting in use amongst the artists of Lombardy when he appeared; when we recollect that he never visited either Florence, Rome, or Venice; that he had few of those advantages of education or example which the works of Signorelli Ghirlandajo, Da

Vinci, and Fra Bartholomeo, furnished to the more fortunate artists of Lower Italy, Raffaele, Michelangelo, and Del Sarto; and when we reflect, that notwithstanding these disadvantages, Antonio, single-handed, and alone, at once effected so extraordinary a revolution in the system of painting, changing harsh colouring and frittered light and shadow for ambient hues, union of effect, and never equalled breadth of Chiaroscuro, Meagre Skeleton-like forms for simplicity and grandeur of design: we cannot deny that he was one of the most extraordinary geniuses ever vouchsafed by heaven, for the guidance and advancement of mankind in the paths of art. He died A. D. 1534, aged 40. As we have occasion to speak of the merits of this divine artist, in our inquiries concerning painting, we beg leave to refer the reader to those articles. See PAINTING, INVENTION, COMPOSITION, DESIGN, EXPRESSION, CLAIR OBSCURE, and COLOURING.

CORREGIDOR, the name of an officer of justice in Spain, and countries subject to the Spanish government. He is the chief judge of a town or province.

CORREGIO, in *Geography*, a town of Italy, and capital of a small principality, in the duchy of Modena, united to the Modenese in 1635; defended by a castle; 8 miles N. W. of Modena, and 25 S. of Mantua.

CORRELATIVE, something opposed to another in any certain relation.

Thus, father and son are *correlatives*; *pater & filius sibi mutuo respondent*. Light and darkness, motion and rest, are *correlative* and opposite terms.

CORRESPONDENCE, or CORRESPONDENCY, denotes the relation and reciprocal adaptation of one thing to another; and also intercourse and friendship.

CORRESPONDENCE, in *Military Affairs*. By our articles of war an officer, non-commissioned officer, or soldier, that corresponds with the enemy, is liable to suffer death. Such a correspondence is also forbidden or interdicted in other countries, under pain of death, in case of disobedience, to every military person of whatever rank, and to every one dependent on the army, in time of war, without the permission of the general who commands, or the governor or commandant, if it be in a garrisoned place.

CORRE'ZE, the *Department of the*, in *Geography*, one of the nine departments in the south of France, was formerly a part of the province called Limosin, and derives its name from the river Corrèze, which partly flows through it from north to south, varying a little towards the west. It is bounded on the north by the department of the Creuse; on the east by the department of Cantal and that of Puy de Dôme; on the south by the department of the Lot; to the south-west by that of the Dordogne, and to the north-west by that of the Vienne.

Though watered by several rivers, as the Corrèze, Vézère, Dége, Luzège, Trivuffonne and Doustre, the department of the Correze has no interior navigation; its rivers are not navigable, but they yield abundance of fish, particularly salmon and trouts. Towards the north there is a chain of high mountains, called Mille Vaches, which are covered with snow a considerable part of the year. The climate is temperate; the soil rather bad, producing little wheat, some barley, rye, buckwheat, and turnips for the cattle: but the meadows yield excellent hay. Hence there is a great trade in horned cattle, horses, mules, and sheep, which are very fine, and the breed of which has been improved by a Spanish flock. Grazing is the chief employment of the inhabitants; their horses are reckoned very good.

The wines of the department of the Correze are tolerable; that which is made in the neighbourhood of Brives is re-

puted almost equal to Burgundy. Game is abundant; there is also plenty of excellent chestnuts, which in some cantons make amends for the sterility of the soil. During the six winter months they constitute the chief food of most of the inhabitants.

As the department of the Correze is rather mountainous, it contains mines of iron, lead, tin, copper, and antimony; sources of mineral water and copper forges. Its principal manufactures are those of fire arms, printed linen and cotton, silk handkerchiefs, muslin, gauze, satin, and poplins, called *Siamoisés imprimées en Indiennes*, wax candles, and writing-paper.

The curiosities of this Department are the volcanic rock of Polignac near Brives, an ancient temple of Apollo, a chapel in which there are Roman inscriptions, a colossal head, and many other remains of antiquity, in the environs of Tintinian.

The department of the Correze is divided into three districts, Uffel, Tulle, and Brives, 29 cantons and 294 communes. Tulle, Meynac, Uffel, Neuville, Brives, and Uzerche are its principal towns. The extent is 5947 square kilometres, or about 900 English square miles, twenty of which are covered with wood. It is inhabited by 243,654 individuals, which give 270 inhabitants for each square mile. The taxes paid by this department in 1803 amounted to 1,588,354 French livres, which make the average contribution of each individual to the public expenditure amount annually to little better than six livres and a half, or about 5s. 6d. sterling. Herbin's *Statistique de la France*.

CORRE'ZE, a town of France, in the department of the Correze, and chief place of a canton, in the district of Tulle, situated on a river of the same name, 8 miles N. E. of Tulle. The place contains 1350, and the canton 6170 inhabitants; the territorial extent comprehends 242½ kilometres, and 9 communes.

CORRHA, in *Ancient Geography*, a town of Asia, in the Greater Armenia, according to Ptolemy.—Also, a place of Asia, situated, according to the same geographer, in Persia Propria.

CORRHAGUM, a strong town of Macedonia. Livy.

CORRIAROK, in *Geography*, a mountain of the Highlands of Scotland, near Fort Augustus, N. W. of Ben Nevis; over which is a military road, in a zig-zag direction. From the foot of this mountain arises the rapid river Spey, and other streams rise to the west, indicating great elevation.

CORRIB LOUGH, a lake of Ireland, in the county of Galway, which is twenty miles long, and mostly from two to five wide, though in the broadest part it is eleven. In the middle it is contracted to a small channel, which is crossed by a ferry at Knock. There are a great number of concealed rocks, which render the navigation of this lake dangerous to those who are not well acquainted with it.

The lake empties itself into the sea by a broad stony river on which the town of Galway is situated about three miles from its southern extremity.

There is a fresh water muscic in this lake, which produces pearls, of which there are some very fine specimens. Beaufort.

CORRICLE. See CORACLE.

CORRIDOR. See CORRIDOR.

CORRIENTES, Los, in *Geography*, a city of South America, in the viceroyalty of Buenos Ayres, situated on the eastern banks of the river de la Plata, near its junction with the river Parana, about 100 leagues north of Santa Fé. In magnitude and disposition it is inferior to Santa Fé, and has no marks of a city except the name. This city was founded in 1589, and was at first greatly infested by

the Abipons, so that it became necessary to establish a corps of militia in order to suppress them. It has now a church and three convents; and it has its particular corregidor, as lieutenant of the governor. S. lat. 27° 32'. W. long. 57° 55'.

CORRIGIOLA, in *Botany*, (diminutive from *corrigia*, a thong of leather) Linn. gen. 578. Schreb. 516. Willd. 578. Gert. 465. Juss. 317. Vent. 3. 262. Class and order, *pentstemonia trigyna*. *H. brotea*, Linn. *Portulacæ*, Juss.

Gen. Ch. Cal. Perianth five-leaved; leaves egg-shaped, concave, spreading, permanent. Cor. Petals five, egg-shaped, scarcely larger than the calyx. Stam. Filaments five, awl-shaped, small. Pyl. Germ superior, egg-shaped, trigonous; style none; stigma three, obtuse. Peric. none, except the converging calyx. Seed solitary, egg-shaped, trigonous. (Not small, roundish trigonous, Gert.)

ET. Ch. Calyx inferior, five-leaved. Petals five. Seed solitary, obtusely trigonous.

Sp. 1. *C. littoralis*. Linn. Sp. Pl. Mart. Lam. Willd. 1. Flor. dan. 334. Eng. Bot. 668. (*Polygonum littoreum minus*, *stoliculis* spadicæo-albicantibus. Bauh. Pin. 281. Moris. Hist. 2. 593-57. 5. tab. 29. fig. 1. *Polygonifolia*; Vaill. par. 162. Dill. gifs. 95. tab. 3.) "Flowers peduncled; calyxes membranous, and white at the edges." Root annual. Stems numerous, prostrate, but little branched, cylindrical, smooth, leafy. Leaves alternate, linear-lanceolate, obtuse, quite entire, somewhat fleshy, smooth, glaucous, attenuated at the base; stipules in pairs, acute, silvery, transparent. Flowers small, white, in many-flowered terminal and lateral clusters; petals, as well as the calyx, permanent. 2. *C. capensis*. Willd. 2. (*C. littoralis*; Thunb. Prod. 53. "Flowers sessile; calyxes green." A native of the Cape of Good Hope.

CORRIGIOLA albella; Forlk. See **ILLECEBRUM Arabicum**.

CORRIRA, in *Ornithology*. Authors describe under this title an ambiguous kind of bird, supposed to be of the Grallæ order, but which appears to be by no means clearly determined. In the "Gmelinian System," it is placed as a genus between the *tantalus* and *scelopax*, or *ibis* and *snipe* tribe. Dr. Latham arranges it among the *palmipides*, between the *recurvirostra* (avocet) and the *phœnicopterus*, or *flamingo*; and is, in this respect, followed by Vielle, and other late French writers. The Gmelinian character of the genus *corrira*, consists in having the bill short, straight, and toothless, thighs larger than the body, feet four-toed, palmated, and the toes very short. In Dr. Latham's Synopsis, the genus is described as having the bill short and straight, legs long, thighs short, feet palmated, and furnished with a back toe. In the Ind. Orn. of the same writer, it is added, that the thighs are longer than the body, and the back toe not connected. Vielle says, the beak is short, straight, and without teeth; the legs short, thighs long, feet palmated and entire, the three exterior toes connected by a membrane, and the posterior one isolated.

This remarkable bird is first described by Aldrovandus, who seems to be the only one acquainted with it: for Ray and Willughby, Brisson, Gmelin, Latham, and Vielle have taken their description of it entirely from Aldrovandus. This writer calls it *trochilus vulgo corrira*; it is also the *corrira* of Brisson, *corrira italica* of Gmelin, Italian courier of Latham, and courier of the French. The names are synonymous, and allude to its swiftness in running. The bird is said to be an inhabitant of Italy; its size rather less than the *avocet*, and with the legs, not so long in proportion; the bill shorter, straight, and yellow, with the tip black; the irides of two colours, first white, surrounded with chestnut; the head, and all the upper part of the body and

wings ferruginous, the under parts white; the two middle tail feathers white tipped with black, the others supposed to be black. We have been minute in the description of this bird, as it is the only species of its genus known.

CORRIVAL, a relative term, signifying, originally, a person, who derived water from the same source, or spring, with another; by means of some common canal, which carried it to both their lands; and which proved the occasion of frequent disputes. Hence the word came to be used for those who have the same pretensions; whether to glory, to love, or the like; but use has abridged the word; and we now both write and pronounce, *rival*.

CORROBORANT, or **CORROBORATIVE**, *Medicines*, are such as tend to augment the strength of the body. These are chiefly vegetable bitters, and metallic salts and oxydes. In the language of the *Materia Medica* they are more commonly denominated **TONICS**, which see.

CORROCORRO, in *Navigation*, a vessel fitted with out-riggers, having an high arched stem and stern, like the points of an half-moon. These vessels are chiefly used by the inhabitants of the Molucca islands, and the Dutch have fleets of them at Amboyna, which they employ as *guarda-costas*. They have them from a very small size to above ten tons burthen. On the cross pieces, which support the out-riggers, are often put fore and after planks, on which the people sit and paddle, besides these who sit in the vessel on each gunnel. In smooth water they are paddled by many persons in different ranks or rows, and are made to move with great speed. They are steered with two *commoodies* (or broad paddles) and not with a rudder. When they are high out of the water, oars are used; but on the out-riggers they always use paddles. A small *corrocorro*, without out-riggers, is called *orembay*.

CORRODENTIA, or **CORROSIVA**, in *Surgery*, corrosives, or corroding medicines. See **CAUSTIC** and **CAUTERY**.

CORROSION, the act of *corroding*, or gnawing away, by little and little, the continuity of the parts of bodies.

CORROSION is used in *Chemistry*, *Medicine*, and *Natural History*; where it stands for a particular species of dissolution, by an acid, or saline menstruum. Corrosion is performed either by immersion or cementation, sprinkling, trituration, or mere contact with a proper menstruum.

CORROSIVE sublimate of mercury. See **MERCURY**.

CORRUDA, in *Botany*, prior; Clus. See **ASPARGUS acutifolius**.

CORRUDA altera; Clus. See **ASPARGUS aphyllus**.

CORRUDA tertia; Clus. See **ASPARGUS albus**.

CORRUDA africana; Rai. Sup. See **ASPARGUS capensis**.

CORRUGATOR, or **CORRUGENS supercillii** in *Anatomy*, a muscle arising from the great canthus of the orbit of the eye, and terminating in the skin about the middle of the eye-brows. See **EYE**.

Its name declares its use; being formed of *con*, together, and *ruga*, wrinkle.

Some reckon this muscle only a prolongation of the *frontales*.

CORRUGATOR coiteri, or *musculus frontalis verus*. This muscle arises fleshy from the process of the *os frontis*, next to the inner or great angle of the orbit, above the joining of the *os nasi*, and superior process of the *os maxillare* with this bone; from thence running obliquely outward and upward, it is inserted in the fleshy part of the *occipito-frontalis*; some of its fibrillæ passing through into the skin, a little higher than the middle region of the eyebrows.

Its use is to smooth the skin of the forehead, by pulling it down after the action of the *occipito-frontalis*; and when it acts more forcibly, it serves to wrinkle the skin of the front between the supercilia; as it happens when we frown, or knit the brows.

CORRUGENT MUSCLE, the same as *corrugator supercillii*.

CORRUPTIBLE. See **INCORRUPTIBLE**.

CORRUPTICOLÆ, a sect who rose out of the Monophysites in Egypt about the year 519, under their chief, Severus, the pretended patriarch of Alexandria.

Their distinguishing doctrine, whence they derived their name, was, that the body of Jesus Christ was *corruptible*, i. e. subject to the affections and changes with which human nature is generally attended;—that the fathers had owned it; and that to deny it, was to deny the truth of our Saviour's passion.

On the other hand, Julian, bishop of Halicarnassus, another Eutychian, a refugee, as well as Severus, in Alexandria, maintained that the divine nature had so insinuated itself into the body of Christ, from the very moment of the Virgin's conception, that the body of our Lord changed its nature, and became incorruptible. His followers alleged that to say the body of Christ was corruptible, was to make a distinction between Jesus Christ and the word, and by consequence to make two natures in Jesus Christ.

The people of Alexandria were divided between the two opinions; and the partisans of Severus were called *corrupticolæ*, q. d. worshippers of something corruptible: sometimes they were denominated *corruptibiles*; Phthartolatæ, Ktistoatæ, and Creaticolæ: and the adherents of Julian Aphthartodocetæ, Docetæ, *incorruptibles*, or *phantasiaæ*. The clergy and secular powers favoured the first; the monks and the people the latter.

Xenaias of Hierapolis struck out an hypothesis, which seemed equally remote from those of both the contending parties: for he maintained, that Christ had, indeed, truly suffered the various sensations to which humanity is exposed; but that he suffered them not in his *nature*, but by a submissive act of his *will*.

CORRUPTION, the extinction of any thing; or the act whereby it ceases to be what it was.

It is an axiom in philosophy, that *the corruption of one thing is the generation of another*.

Corruption differs from *generation*, as two contraries differ from each other.

It differs from *alteration* as a less from a greater, or a part from the whole: a thing being said to be *altered*, when it is not so far changed but it may be known, and still keeps its old name; both which it loses by *corruption*.

But, as in *generation*, no matter is produced that did not before exist; so in *corruption*, nothing is lost, but that particular modification which constituted its form, and made it to be of such a species.

CORRUPTION of blood, in *Law*, an infection accruing to a man's state, attainted of felony, or treason, and to his issue: So that an attainted person can neither inherit lands or other hereditaments from his ancestors, nor retain those he is already in possession of, nor transmit them by descent to any heir: but the same shall escheat to the lord of the fee, subject to the king's superior right of forfeiture;—and the person attainted shall also obstruct all descents to his posterity, whenever they are obliged to derive a title through him to a remoter ancestor. Moreover, if he were noble, or a gentleman, he, and all his posterity, are thereby ignoble and degraded. Nevertheless, the king's pardon cleanses the corruption of blood in those children born after the pardon,

not in those born before it; these latter continuing still incapable of inheriting the land of their father, purchased before the time of the pardon.

This corruption of blood cannot be absolutely removed but by authority of parliament. The king may excuse the public punishment of an offender; but cannot abolish the private right, which has accrued or may accrue to individuals as a consequence of the criminal's attainder. He may remit a forfeiture, in which the interest of the crown is alone concerned; but he cannot wipe away the corruption of blood; for therein a third person has an interest, the lord who claims by escheat. If therefore a man hath a son, and is attainted, and afterwards pardoned by the king: this son can never inherit to his father, or father's ancestors; because his paternal blood, being once thoroughly corrupted by his father's attainder, must continue so; but if the son had been born after the pardon, he might inherit; because by the pardon the father is made a new man, and may convey new inheritable blood to his after-born children. (Co. Litt. 392.)

Upon the whole it appears, that a person attainted is neither allowed to retain his former estate, nor to inherit any future one, nor to transmit any inheritance to his issue, either immediately from himself, or immediately through himself, from any remoter ancestor; for his inheritable blood, which is necessary either to hold, to take, or to transmit any feudal property, is blotted out, corrupted, and extinguished for ever: the consequence of which is, that estates, thus impeded in their descent, result back and escheat to the lord. By reason of the peculiar hardship attending this corruption of blood, arising from feudal principles, it is declared in most (if not all) of the new felonies created by parliament since the reign of Henry VIII., that they shall not extend to any corruption of blood: and by the statute 7 Ann. c. 21. (the operation of which is postponed by the statute 17 Geo. II. c. 39.) it is enacted that, after the death of the late pretender, and his sons, no attainder for treason shall extend to the disinheriting of any heir, nor the prejudice of any person, other than the offender himself; which provisions have indeed carried the remedy farther than was required by the hardship above complained of; which is only the future obstruction of descents, where the pedigree happens to be deduced through the blood of an attainted ancestor. Blackst. Com. Book ii. See **ATTAINDER** and **ESCHEAT**.

CORSA, in *Architecture*, the same with **PLAT band**.

CORSA, or **CORSÆ**, in *Ancient Geography*, a town of Bœotia, seated on the top of a mountain above the Cyttones. About half a stadium below this town was a sacred wood, in the midst of which was to be seen a small statue of Mercury. Pausanias, l. ix.

CORSAIR, in *Naval History*, a pirate, or person who scours the seas, especially the Mediterranean, with a vessel armed for war, without commission from any prince, or power; to plunder merchant-vessels.

The word comes from the Italian *corsare*, of *corso*, or *à corsibus*, by reason of their courses, or excursions.

The name is commonly given to the piratical cruisers of Barbary, who had their rise about the beginning of the sixteenth century, and who frequently plunder the merchant-ships of countries, with which they are even at peace. A corsair differs from the commander of a privateer in this respect, that he traverses the seas in an armed vessel without any commission, and for the express purpose of seizing and robbing merchant-ships, whereas the captain of a privateer acts under a commission, and only attacks the vessels of the enemy who are at war with the prince or states from whom

he has his commission. A corsair or pirate pays no regard to the laws of war or peace, and when taken may of course be hanged without ceremony. But people belonging to privateers are guided by those laws, and when taken are regarded and treated as prisoners. For an account of the rise and progress of these pirates; see *BARBAROSSA* and *BARBARY*.

The piratical depredations of the Illyrians under their queen Teuta, first forced the Romans to visit Illyria and Greece. And the Ætolians, who are described and represented by Polybius as the corsairs or pirates of Greece, contributed greatly to the subjugation of the Romans.

CORSANO, in *Geography*, a town of Naples, in the province of Otranto: 3 miles E. of Alessano.

CORSE, a town of France, in the department of the Mayne and Loire; 7 miles N. E. of Angers.

CORSE, in *Ancient Geography*, an island of the Mediterranean sea, on the coast of Ionia, and near the isle of Samos. It is called *Corfia* by Strabo and *Corfea* by Pliny.

CORSELET, a little cuirass, according to some; and according to others, a coat or cover for the whole trunk, anciently worn by the pikemen commonly placed in the front and flanks of the battle, for the better resistance of the enemies' assaults, and the surer guard of the soldiers placed behind, or within them. Vaugelas observes, that the seamen were anciently armed with corselets.

CORSENDONCENSIS CODEx, in *Biblical History*, a name given by Erasmus to a MS. which he used in the second edition of his Greek testament, when it belonged to the Collegium Corsendoncense in Quampinia; containing the whole New Testament, the book of Revelation excepted, and supposed to have been written in the 12th century. It is noted 3 in the 1st, 2d, and 3d parts of Wetstein's New Testament. This copy was collated by Walker, whose extracts were inserted in Wetstein's collection. At that time it was in the library of a Dominican convent at Brussels. It is at present in the imperial library at Vienna, whither it was brought from that of prince Eugene.

CORSEPRESENT, in *Ancient Authors*, denotes a mortuary. The word is formed of the French, *corps present*; and the reason of the denomination is probably this: that where a mortuary, after a man's death, became due, it was offered, or *presented* to the priest, and carried along with the *corpse*, when it came to be buried: and this term denotes that it was once a voluntary donation. See *MORTUARY*.

CORSEUL, in *Geography*, a town of France, in the department of the North Coasts, and district of Dinan; two leagues W. N. W. of Dinan.

CORSHAM, or *COSHAM*, a small town of Wiltshire, in England, is situated in a flat and dry part of the country. It was, during the Anglo-Saxon dynasty, a place of some note, as Camden observes, that here was anciently a "royal vill of king Ethelred," and it was "famous for the retirement of the earls of Cornwall." There is a handsome modern market house, which was erected at the expence of the late Paul Methuen, esq. in the year 1784. The church is a large ancient building, with a steeple, and on the south side is a chapel or chantry, raised by the Hungerfords, whose family at one period possessed this lordship. The vicar of Corsham possesses very peculiar privileges, having episcopal jurisdiction over the whole parish: and the bailiff of the manor always exercises the offices of sheriff and coroner over the lordship. The town consists chiefly of one long street, and the houses, many of which are very respectable,

are all built of free-stone. This town gave birth to Sir Richard Blackmore, a voluminous writer of physical, theological, and poetical works. (See *BLACKMORE*.) Contiguous to the town is (Corsham-house,) the elegant seat of Paul Cobb Methuen, esq. The mansion is a large handsome building, and several of its apartments are filled with pictures by the most eminent masters. Being only nine miles from Bath, this celebrated collection is much visited, and the proprietor has liberally appropriated Tuesdays and Fridays to show the whole to strangers. For an account of these and the house see "An Historical Account of Corsham-house, 8vo. 1806," "Beauties of Wiltshire," vol. ii. p. 264.

CORSI, in *Ancient Geography*, a people who inhabited the northern part of the island of Sardinia. Pausanias and Ptolemy say, that they were a colony from the isle of Corle or Corsica.

CORSI, NICCOLO, in *Biography*, a Genoese painter of considerable merit, who flourished in 1503. In the monastery of the monks of mount Oliveto at the village of Quarto, three miles from Genoa, were several of his frescoes, which evinced fecundity of invention, a just idea of expression, and skill in the management of colours; they were not however exempt from that dryness of style which characterises the works of the early painter. Some of these stories, particularly one relative to S. Benedetto, still remain. Strutt informs us that an engraving of the portrait of Parmegiano is attributed to this artist. The fact is not probable. Soprani, Lauzi, Storia, Pitt.

CORSI, MARC ANTONIO, an engraver, who flourished in 1760, and who executed several of the plates for the Museo Fiorentino, besides many other prints after Cypriani, J. Zocchi, and others. Heineken, Strutt.

CORSIARA, in *Geography*, a town of Persia, in the province of Farsistan; 100 miles S.W. of Schiras.

CORSICA, or the *Isle of Corse*, called by the Greeks *Kyros*, *Cyrnus*, in *Ancient Geography*, an island of the Mediterranean, situated to the north of the island called by the ancients Sardinia. The first name, according to Servius, was Therpne. According to Seneca, the Greeks, who migrated from Phœcia in Asia, founded Marseilles in Gaul, and established themselves in the isle of Corse. When they left it, the Ligurians and Hispani occupied it. In the time of the Romans, two colonies were conducted thither: one by Marius, and another by Sylla. The inhabitants were called *Corsi*. In the middle of the island are mountains, and among these was the ancient "Mons Aureus." The principal promontories, to the north, were "Sacrum Promontorium;" to the east, "Vagum Promontorium," and "Granianum Promontorium;" to the south, "Marianum Promontorium;" to the west, "Rhium Promontorium," "Viribulum Promontorium," and "Actium Promontorium." The chief ports were "Favonii Portus," and "Syracusanus Portus," to the east; and "Titianus Portus," to the west. The principal towns were, on the east side, "Mantinorum Oppidum," "Mariana," and "Aleria;" and on the west side, "Mariana," and "Urcinium;" and to the north, "Canalata." Pliny assigns 33 towns to this island; but he probably included all the places that were inhabited. The Roman colonies were "Mariana" and "Aleria." Corsica was one of those islands into which the emperors sent their exiles. Of this number was Seneca, the philosopher, who, being accused of adultery under the reign of Claudius, was banished thither by that emperor. See the next article.

CORSICA, the Island of, in *Geography*, situated in the Mediterranean sea, between the 41st and 43d degree of N. latit.

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N. latitude, and the 8th and 10th degree of E. longitude, was probably first peopled by the inhabitants of the opposite coast of Italy. It was successively conquered by the Carthaginians, Romans, Vandals, Goths, Lombards, and Saracens. About the year of our era 725, the French first entered Corsica under Charles Martel; and the family of the Colonnas established themselves as sovereigns in the island, about the end of the eighth century. But their family divisions created troubles, and were followed by a state of anarchy, which was at its utmost height in the beginning of the eleventh century. The popes interfered. To restore peace, they declared themselves sovereigns of the island; and Gregory VII. excommunicated the Genoese as usurpers of ecclesiastical property, for having taken possession of Corsica. In 1071, Urban II. sold Corsica to the Pisans. Genoa disputed this sale. Innocent II. divided the island into two rival republics. Not being able to agree with the Corsicans, the Pisans ceded their part again to pope Urban IV.; and Boniface VIII., thinking that a part carried with it the rest, made a present of the whole island to the kings of Arragon, from whom it returned under the yoke of Genoa.

The first known assembly of the Corsicans, as a national body, was held in the year 1359, to take into consideration the evils which they suffered, both from the incursions of foreigners, who disputed with each other for the conquest of their country, and from the animosity of their nobility, who in certain districts had assumed the title and despotic authority of kings. The Genoese, who were then at the summit of their power, possessed a great part of the island. By the advice of the brave Sambuccio, and to free themselves at once of the Pisans, of the Arragonese, and of the petty tyrants by whom they were oppressed, the Corsicans claimed the assistance of the Genoese, and associated them in the sovereignty of the whole island. But the happiness produced by this semi-national administration lasted only a few years. Tired of the Genoese yoke, the Corsican chiefs assembled privately in 1385, and chose as their head Henry de la Rocca, under whose command they took several of the Genoese garrisons; but in the midst of his triumphs, Rocca was killed in an action, and the Corsicans again submitted to Genoa. They participated for a long time in the fate of this republic; and with it belonged sometimes to the French, sometimes to the Milanese, and sometimes to the Neapolitans. At last they gave themselves up to the lords of Piombino, who, at the end of the fifteenth century, sold Corsica to the Bank of St. George. This occasioned new stipulations with the Genoese; but these were soon disregarded. The persons appointed to govern in the name of the Bank, in which the chiefs of the Genoese republic were interested, had recourse to the most oppressive measures; and to subdue the opposition which they encountered, employed fire and sword. Eighteen pieves or parishes were destroyed, and more than a hundred villages reduced to ashes. The governors vied with each other in barbarity. One of them convoked a council of the chief men of the island, and, at the end of a grand entertainment, caused them all to be put to death by soldiers appointed for that treacherous purpose. Thus perished the heads of the most illustrious Corsican families. Four thousand nobles fled; and the Genoese gave their estates to the poorest of their countrymen, who would chuse to reside in the island.

This horrid transaction inflamed every heart with the most violent resentment. The people ran to arms; warriors, formed in foreign service, returned to assist their country; and the French, who were at that time enemies to the Genoese, helped the Corsicans to break their chains. The flames of civil war raged with fury. Neither the Corsicans

nor the Genoese gave any quarter; and whoever happened to escape the murderous sword was sold as a slave to the Turkish Corsairs, who hovered round the island. On resigning their conquests, the French obtained for their friends conditions which would have softened their fate, but which were either eluded or openly violated.

Filled with indignation against the unrelenting persecutors of his country, San Pietro d'Ornano, a noble Corsican, married to a Genoese lady named Vannina, whom he left at Marseilles as a place of safety, made a voyage to Constantinople, to solicit assistance from the Ottoman Porte. The Genoese imagined that if they could get Vannina into their hands, they should be able, with that valuable hostage, to suspend the fury of her husband. They employed traitors, who, insinuating themselves into her confidence, persuaded her to repair to Genoa, to effect a reconciliation between the gallant d'Ornano and the republic. She was just on the point of leaving Marseilles when San Pietro returned. He considered her as guilty of preferring her country to her husband, and strangled her with her garters. He then carried on an obstinate and bloody war against the Genoese; but fell into an ambuscade, prepared for him by one of Vannina's brothers, and expired, saying, "I am a barbarian; Vannina is avenged."

Leonardi di Costa Nuova, San Pietro's lieutenant, having unfortunately been taken prisoner, his youngest son, Antonio, by disguising himself in the dress of the servant girl who used to carry his father's meals, got into his prison, and enabled him to escape. Moved by this act of filial piety, the Genoese caused the young man to be hanged. They were bent upon ruling through fear. They considered Corsica merely as a colony destined to enrich their capital. Not a single article was allowed to be exported to any other place than Genoa. In years of scarcity, the island was stripped of its provisions; and the Corsicans were frequently exposed to the horrors of famine, whilst their despots lived in abundance. In vain did they attempt to find another master. When Louis XIV. bombarded Genoa, they offered him their island; but he declined their offer, and the unfortunate Corsicans were forced to continue submissive to their oppressors.

But in the year 1729, a poor peasant, who only wanted one penny to complete his tax, reproached them for their extortions with an energy which made a deep impression on those around him. At the same time, a Corsican soldier was condemned to the wooden horse. The Corsicans used a few jocular expressions with regard to this military punishment, which gave occasion to a quarrel; and these feeble sparks produced a conflagration which soon set all Corsica in flames. Armed with old muskets, rusty lances, and hatchets, the people forced the military magazines, where they found more regular weapons. In a short time they formed a disciplined army, commanded by chiefs who knew how to make choice of proper posts; and by their manoeuvres, acknowledged their determination to expel the Genoese from the island. The latter called Austrian troops to their assistance. But the Imperial banners did not frighten the Corsicans; neither were they softened by an amnesty which the senate of Genoa offered. They decreed, on the contrary, that the first person who proposed the acceptance of the amnesty should be put to death. They sent their wives and children, with those enfeebled by age, to the mountains; and swore that they would expose themselves to a thousand deaths, rather than lay down their arms, whatever proposals might be made to them by the Genoese or the Imperialists. At last, however, after a contest of four years, they consented to an agreement, under the guarantee of the emperor.

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But at the end of two years, the troubles, which had been incompletely allayed, were again revived. The Corsicans renounced their dependance on Genoa, and openly declared themselves sovereigns, under the immaculate conception of the most blessed virgin Mary, whose image they carried on their colours. They were strenuously exerting themselves to defend the island against any reinforcements sent by the enemy, when, in the month of March 1756, a stranger, attired in a Frankish robe, arrived at Aleria, on board of an English ship of 24 guns, and brought with him 10 pieces of cannon, 4000 muskets, 3000 pairs of shoes, a quantity of provisions, and a small supply of money. He was Stephen Theodore, son of Anthony, baron de Neuhoff, descended from one of the most noble houses in the county of Mark in Westphalia. His son, Frederic, who in the year 1768 published at London "Memoirs of Corsica," swells the succour which his father brought to the Corsicans to 14,000 sacks of grain; 6 pieces of brass cannon, twelve pounders; 20,000 muskets; bayonets, and other implements of war; 14,000 uniforms; as many pairs of shoes; the same number of hats; and a chest full of gold, containing 100,000 sequins.

After various adventures in different countries of Europe, Neuhoff had got acquainted with the Corsican malcontents who were confined at Genoa, and interested himself in their behalf. He intrigued in their favour at Constantinople, chiefly through Rakoczy, a prince of Transilvania, who had been stripped of his principality by the emperor of Germany, and had retired into Turkey. When he arrived, the Corsicans imagined they beheld a protecting deity. Without consulting the dictates of prudence, they conducted him to Corte, amidst the acclamations of the people, and, in a general assembly, proclaimed him king of Corsica and of Capraja, under the name of Theodore the First. The baron then assumed all the appendages of royalty, coined money, established tribunals; and, being well supported in the moment of enthusiasm, took some fortresses of the enemy, and declared the Genoese banished from Corsica, under the pain of death, if they should ever again set foot in the island. The Genoese, on their part, set a price on the head of the new monarch. Anquetil justly remarks, that this infamous resource is too commonly resorted to by republics, because they are not afraid of reprisals.

The aid which king Theodore had brought was not considerable. He promised his subjects assistance of much greater importance, and as they shewed some impatience at the tardiness of its arrival, the monarch himself set sail in search of succour, sent provisions to the island from time to time, and returned with a vessel richly laden with necessaries. The wise regulations which he established, stifled the murmurs of the malcontents. A storm, however, more dangerous, was raised up against him. As he had arrived the next time in an English vessel, the French imagined that the British government had some designs on Corsica, and anticipated its views. Informed of their intention, the Corsican monarch again embarked to procure assistance; but having, with difficulty, escaped from a plot which had been formed to deliver him to the Genoese, he wandered about from port to port, and retired at last to England, where he languished several years in prison for debts, and died soon after his release, in extreme indigence, on the 11th of December 1755.

An accommodation had taken place some time before Theodore's death, between the Corsicans and the Genoese, under the guarantee of France. But when the French withdrew their troops, the islanders again resisted the Genoese, under the command of a nobleman named Gaffori, who com-

municated to his countrymen the hatred which he felt for the oppressor of his country. Having laid siege to a fortress, the Genoese made a sortie, and took one of his children, then at the breast. They threatened that, if the father did not cease firing, they would expose the child on the walls; and they were so cruel as to put their threat into execution. Gaffori being more attached to his country than to his family, continued his fire: but fortunately the child was not hurt, and the Corsican General made himself master of the fortress, and was soon after treacherously assassinated.

After the death of Gaffori, the general council, presided by Clement Paoli, recalled Pascal Paoli, his brother, from Naples, where he had sought shelter against the Genoese, to whom he had been frequently opposed, and elected him on the 15th July 1755, when he was but 29 years of age, chief of the Republic; in the government of which he was to be assisted by two counsellors of state, and one of the most reputable persons from each district, all of whom were to be changed once a month.

Paoli conducted himself so well, both in the council and the army, that he gave great uneasiness to the Genoese. Their fear induced them to send, in 1761, a solemn deputation to a general assembly convoked at Veccovato, for the purpose of offering peace: but the Corsicans would listen to no proposals, unless they were acknowledged as a free and independent nation. The general enrolled all the inhabitants capable of bearing arms, disciplined his troops, caused money to be coined, and made his administration feared and respected. He drove the Genoese from the open country, and shut them up in the maritime towns.

In the mean time the Genoese obtained assistance from France. In 1764, the French general Marboeuf, an officer of considerable talents, landed with six battalions. Paoli now employed caution and political prudence, and listened to proposals for peace; but firmly adhered to the resolution of obtaining freedom and independence for his country. This began to excite in the English nation a wish to serve the unfortunate Corsicans; and a young Scotchman, the late Mr. Boswell, son of Lord Auchinleck, having been induced to visit Corsica about the same time, Paoli did not discountenance the report that he was sent thither on a secret mission. England, however, did not interfere; and Genoa having renounced the sovereignty of the island in favour of the king of France, a French army of 5000 men, under the command of the marquis de Chauvelin, supported by two ships of the line, two frigates, and six armed brigantines, invaded Corsica in 1768. A furious war ensued; in which numbers, military science, money, and discipline, were on one side, and on the other, an almost unarmed multitude, enthusiasm, bravery, and the cause of liberty. After various successes, an action was fought on the 7th of September 1768, in consequence of which the French retired to Bastia. The marquis de Chauvelin left the army; the command of which was given to Count de Vaux, who, bringing with him considerable reinforcements, effected the subjugation of Corsica in 1769. Paoli, after having defended his country to the last, escaped in an English ship, which took him to Leghorn, from whence he repaired to London. The celebrated ex-general Dumourier, who served in the French army as adjutant-general, pays high compliments to the Corsicans, and their chief, in the memoirs of his own life. See PAOLI.

In the year 1792, Paoli returned to Corsica, after having taken the oath of fidelity to the constituent-assembly of France, and was elected mayor of Bastia, commander in chief of the national guard, and president of the department. When the execution of Louis XVI. rendered a civil war probable in France, Paoli thought it a favourable opportunity

to effect the deliverance of his country from all foreign yoke. He therefore determined to call in the assistance of England; and invited Lord Hood, who was then at Toulon, and who had recently been foiled in an attempt against Corsica, to invade it anew. An expedition failed from the bay of Hieres on the 24th of January 1795, for the express purpose of driving the French out of the island. The troops, under the command of lieutenant-general Dundas, took the tower of Morfella, Fornelli, and San Fiorenzo; and Bastia and Calvi having likewise yielded to the English, a general confulta was assembled at Corte, in which the union of Corsica with the British empire was unanimously voted. This proposition having been readily accepted on the part of the English commissioner, Sir Gilbert Elliot, now lord Minto, he was immediately invested with the dignity of vice-roy.

But Corsica did not continue long an appendage of the British crown. Jealousies arose between the English viceroy and General Paoli. The latter returned to England; and before his departure, exhorted his countrymen to remain firm in their allegiance to Great Britain. His exhortation had however little effect upon the Corsicans. The splendour of the victories of their countryman Bonaparte in Italy, determined them to return to their allegiance to the French. The English troops evacuated the island, and Corsica has ever since continued a province of the French empire. Anquetil's Summary of Universal History, vol. vii.

Corsica is bounded to the north by the Ligurian sea, and the gulf of Genoa; to the east by the Etrurian sea; to the south by the Strait, which separates it from Sardinia; and to the west by the Mediterranean. It is about 180 kilometres distant from the coast of Antibes, 90 from that of Etruria, and 18 from Sardinia. Its greatest length from the most northern part, which is Cape Corso, to the southernmost, near Bonifacio, is about 170 kilometres. In some places it is 80 kilometres broad, in others 65 kilometres, and in some much less; its whole extent may be estimated at $6222\frac{1}{2}$ square kilometres. A chain of mountains traverses the island in form of a cross, and divides it east and west into two parts, called by the inhabitants *Banda di dentro*, and *Banda di fuori*, or *Di qua dai monti*, and *Di là dai monti*, on this side, and on that side of the mountains.

The climate of Corsica is mild. The sea-breezes temper the cold which proceeds from the mountains covered with snow, and the wind which blows over them, renders the summer's heat less oppressive. Some of the winter months are not exempted from violent storms. The air in several places is bad, owing to the many stagnated waters and marshes, which, however, are now in a train of being drained. Every where else the air is clear and salubrious. The inhabitants live to a very great age.

Corsica is watered by several rivers, of which the Golo is the most considerable. Like the sea coasts, they abound in fish of all sorts, particularly sturgeons, pilchards, and oysters, great quantities of which are exported to Italy. Beautiful coral is found on the coast opposite to Sardinia. In the centre of the island are large lakes, of which the Creno and the Ino are the principal. Towards the shore are several marshes, some of which, being filled with sea water, yield salt sufficient for the consumption of the island.

The soil of Corsica is fertile even in the mountains. It produces wheat, rye, barley, millet, but no oats. The horses and mules are fed with barley. Agriculture, however, is in a very imperfect state. The implements of husbandry are bad; and the use of manure, which might be had in abundance, is scarcely known. In several cantons, Corsica has excellent wine. At Cape Corso, they make two sorts of white wine; one of which resembles mountain so well, that

it is sold in Germany for genuine Malaga, and sent to Leghorn for the English market, where it also passes for Spanish wine; the other resembles the French muscat wine, called Frontignae. The white wine of Furiani has all the qualities of that of Syracuse, and that of some villages has the flavour of Tokay. At Vescovato and Cumpatoro, they have a wine which resembles Burgundy. There is besides an abundant harvest of dry raisins. The olive tree thrives all over the island, and is one of its greatest riches. It grows thicker and higher than in the southern departments of France. The oil is good; but might still be better, if it were more carefully prepared. It is to the father of the extraordinary man who is at the head of the French government, that the Corsicans are indebted for the introduction of the olive tree in their country. Lemon, pomegranate, orange, almond, and mulberry trees, are also doing extremely well. Chestnut trees, in particular, are so abundant, that their fruit forms a considerable branch of the Corsican exports. The fruit of this tree is collected with very little trouble; but, as it serves as food for both horses and men, it renders the latter indolent. Aloë's flower here as well as in the East. Oaks, fir, cedars, and especially pines, grow to a great height; and, if it could be easily transported, the forests yield sufficient timber for the establishment and maintenance of a large fleet. Their produce might be increased to eight millions of livres, instead of one hundred thousand. Flax is grown in abundance. The island swarms with bees. Their honey, however, has rather a sharp taste, on account of the strong flavoured plants from which it is collected. That of Caccia passes for the best. The wax is famous for its goodness and firmness.

Corsica has all kinds of wild and tame animals. Its horses are of the Sardinian breed. Like their mules and asses they are small, but active and strong. The horned cattle is larger in size, but inferior in quality. There is not sufficient pasture. The cows give but little milk, and the oxen are lean. Grazing is completely neglected, or rather not understood. The produce of the dairy is not much in request. Oil supplies the place of butter as in all hot countries. Some cantons however are noted for good cheese. The flocks of sheep are numerous. As they have excellent pasture on the mountains the mutton is exquisite, and makes amends for the badness of the beef. The sheep in general are black and tawny. The coarseness of their wool is attributed to their being of a mongrel breed, but some of the inhabitants pretend that it proceeds from the nature of the pasture, since sheep which have but a coarse fleece in one farm, will yield a finer wool if transferred to another farm whose pasture is superior. It is nothing uncommon to see sheep with more than two horns. Some have as many as six. The *muffoli* is a kind of wild ram covered with hair instead of wool. Game is plentiful: but there are neither wolves nor rabbits, and very few venomous animals.

No country in proportion to its size is richer in mineral productions than Corsica. Lead is found at Buzaggia; copper at Verde; iron at Corte, Cape Corso, and near Farinole; antimony at Erza; silver at Caccia, Farinole, Galeria, and near San Fiorenzo, where the mine yields nearly 125 livres *per cent.* or 50 kilogrammes. There are quarries of fine serpentine stone, called *vert de corse*, Corsican green, and at Hospitale, near Porto Vecchio, quarries of beautiful black porphyry spotted with pink. Corsica has also alum, granite, jaspis, talc, asbestos, and salt-petre.

The island of Corsica is not very populous. The intestine wars by which it has been ravaged for ages have great-ly

ly contributed to its depopulation. In Pliny's time there were no less than thirty-three large towns; their number now is reduced to nine. In 1740 Corsica contained 133 parishes, 427 villages, 26854 hearths, and in all 120,380 inhabitants. In 1760 their number had risen to 150,000. In 1787 Mr. Necker estimated the population of Corsica at 124,000 individuals; and by the last returns of 1802 it was found to contain 166,813 inhabitants. It is the twenty-third military division of France. For its civil administration it is divided into two departments, the *Golo*, which has Bastia for its chief place, and the *Liamone* of which Ajaccio is the principal town. The two departments are subdivided into six districts, 60 cantons, and 391 communes.

Industry and arts have made but little progress in Corsica. Manufactures are in their infancy. Their woollen and linen cloth is of the coarsest kind. The leather of which they make their shoes is not tanned, but hardened in the air, and the little they do tan for other purposes receives a greenish hue from the dried wild bay leaves which they use, though they are no strangers to the true process of tanning, and export great quantities of bark to Italy.

The trade of Corsica is inconsiderable. Besides the articles of home consumption it consists chiefly in the sale of the coral which is found on the coasts. Both from its situation and from its produce, Corsica might enjoy a much more extensive commerce. Its coast offers almost every where a good anchorage for vessels of a light draught; it has numerous ports: to the north *Centuri*; to the west *San Fiorenzo*, *Isole Rossa*, *Calvo*, *Ajaccio*; to the south *Bonifacio*; and to the east *Bastia*, *Macciano*, and *Porto Vecchio*, which is one of the best harbours in Europe; and the vicinity of the islands of Capraja, Gorgona, and Elba, affords a safe retreat to small vessels that are overtaken by a storm.

The Corsicans are well made, but thin and swarthy. They are the descendants of so many nations that it is difficult to determine their character. Strabo calls them brutal, stupid, and indolent. Pliny praises them as just, generous, valiant, and humane. Some modern travellers describe them as turbulent and ferocious; others as compassionate and hospitable, and restless only when they are oppressed. It appears however from all accounts, that besides ignorance, indolence, want of probity and confidence, and superstition, the vice to which the Corsicans are most prone is revenge. They used to carry their vindictive spirit to such an excess, that those who conceived their honour injured, would suffer their beards to grow till they had revenged the affront. These beards were styled *barbe di vendetta*. And even now the proverb *Il Corso non perdona mai ne vivo ne morto*, and the generally received expression *ad una inimicitia di sangue* are sufficient evidence that their enmities are still propagated from one generation to the other. But at the same time it cannot be denied that the Corsicans are sober, brave, intrepid, active, sagacious, and hospitable. It is not unusual to hear those who guard flocks of sheep in the mountains sing stanzas of Tasso's poems, but in a less brilliant manner than the Italian shepherds. Memoirs of Corsica. Herbin's Statistique de la France.

CORSINI, EDWARD, in *Biography*, was born at Fanano, in Italy, in the year 1702, and applied himself early in life to the study of philosophy. Scarcely had he attained to manhood when he made himself known by a work in six volumes octavo, entitled "Philosophical and Mathematical

Institutions." His next works were treatises on practical and theoretical geometry, intended as elementary works for the young. From the publication of these, he seems to have applied himself with much ardour to the study of the ancient classics, particularly to the Greek writers. In connection with which he published at different periods, in four volumes, a work entitled "Fassi Attici in quibus Archontum Atheniensium Series, Philosophorum aliorumque illustrium Virorum Ætas, atque præcipua Atticæ Historiæ capita describuntur." He was appointed professor of metaphysics in the university of Pisa in 1746; and in the following year he published "Dissertations on the sacred Games of the Greeks," in which he has recorded a list of the victors in the athletic contests. After this we find a work of Corsini on Greek inscriptions, and another entitled "A Course of Metaphysics," intended no doubt for his pupils. He had long assumed the ecclesiastical character, and in 1754 was made general of his order. His time was now much occupied by the duties of his office, but his leisure hours he devoted to literary pursuits, especially those connected with ancient times. He died in the year 1765 of an apoplexy, having just completed the first volume of "A History of the University of Pisa," of which city he had been appointed historiographer. Moreri.

CORSINI, PETER, in *Biography*, a native of Florence, where he distinguished himself towards the close of the fourteenth century. Having received the diploma of doctor of law, he was shortly after appointed auditor of the sacred palace, and raised to the episcopal dignity. In 1363 he was sent by pope Urban V. legate to Germany, and in 1370 he was created cardinal by the same pope. After the death of Urban, Corsini embraced the interests of Clement VII. in opposition to Urban VI., and joined the court of Clement at Avignon, where he died in the year 1405. As an author he was not much celebrated, but he wrote the lives of some of the popes, which are noticed by ecclesiastical writers. Moreri.

CORSINI. See BANKERS, in the *Court of Rome*, and CAURSINI.

CORSNED BREAD, *panis conjuratus*, *curfed bread*, or *morsel of execration*, a superstitious manner of trial, used among our Saxon ancestors, by a piece of barley-bread, or cheese, first consecrated by the priest with a form of exorcism, then offered the suspected criminal to be swallowed by way of purgation: from an opinion that a guilty person could not swallow a piece of bread or cheese, so accursed, or if he did, that it would choke him.

The ceremony was accompanied with a prayer, beseeching God, "That the criminal's jaws might be shut, his throat so narrow, that he might not swallow, and that he might cast it out of his mouth." Du-Cange. This corned was then given to the suspected person, who at the same time received the holy sacrament; if, indeed, the corned was not, as some have suspected, the sacramental bread itself; but the subsequent invention of transubstantiation preserved it from profane uses with a more profound respect than formerly. Our historians assert that Godwin earl of Kent, in the reign of king Edward the Confessor, abjuring the death of the king's brother, at last appealed to his corned, "per baccellam deglutendam adjuravit," which stuck in his throat, and killed him. Some traces of this obsolete custom still remain in certain cases of abjuration retained among the common people; as "I will take the sacrament upon it;" "may this morsel be my list," &c.

CORSO, in *Commerce*, a duty paid in the Caraccas, and in some other parts of Spanish America, on entering and clearing

clearing from the sea-ports. Its produce is applied to the support of vessels employed in preventing contraband trade. It ordinarily yields 150,000 hard dollars per annum.

CORSOER, or **KORSOER**, in Latin *Cruisjora*, a small town of Denmark, situated in Zealand, on a point of land in the Great Belt, opposite the town of Nyeborg in Funen. This is the usual passage across the Great Belt; the distance between the two towns is about twenty English miles. Corsoer is a staple town, and carries on a considerable trade, but its harbour is only fitted for vessels which do not draw above nine feet water. Near the town is an ancient castle with a ditch and rampart, with a few useless cannon, more for form than service. It contains the commander's house, formerly a royal palace, and a granary, and is garrisoned by a few invalids. Corsoer is about 52 English miles W. of Copenhagen, N. lat. 55° 22'. E. long. 11° 15'.

CORSOIDES, in *Natural History*, a name given by some authors to a species of agate of a greyish white, full of slender veins, of a clearer white, resembling hairs. It is one of the German agates, and sometimes seen among our jewels, cut into tops of snuff-boxes, and other toys, but is not much esteemed.

CORSOTE, **SURA**, in *Ancient Geography*, a town or fortress of Asia, in Mesopotamia, on the banks of Masca, according to Xenophon. M. d'Anville places it on the left of the Euphrates, at the confluence of Masca.

CORSTORPITUM, a town of Albion, placed in the first route of Antonine, between Bremenium or Riechester and Windomora, or Ebchester, now Corbridge, twenty miles from the former.

CORSURA, an island of Africa, placed by Strabo in the gulf of Carthage.

CORT, **CORNELIUS**, in *Biography*, a designer and engraver of great celebrity, was born at Hoorn, in Holland, in the year 1536. He evinced an early inclination for engraving, and is conjectured to have been educated at Antwerp, in the school of Jerom Cock, an artist of considerable merit, and a great publisher of prints. With this artist Cort continued several years, during which time he executed an incredible number of small plates from pictures of the Flemish and German masters, which, however, generally bear only the name of the publisher. His reputation, notwithstanding, was already established, for we find, that upon his arrival at Venice, in his way to Rome, he received so flattering an invitation from Titian, that he was induced to make a long sojourn in the house of that great artist, and to engrave many of his finest pictures. After this he took up his residence at Rome, where he executed a prodigious number of admirable plates from the works of Muziano, the Zuccari, and others. Here he established a school of engraving; and it is a sufficient eulogium to say, that he numbered the celebrated Agostino Carracci amongst his disciples. He died at Rome 1578. M. Heineken has given a complete catalogue of the works of this skilful artist; we shall only enumerate the following, which are fine specimens of his abilities: "The Martyrdom of St. Lawrence," 1571, an upright plate, in folio, from Titian; "Diana discovering the incontinence of Calisto," from the same painter, 1566, upright in fol.; six admirable large upright-landscapes, from Muziano, in which are introduced St. John the Baptist, Mary Magdalen, St. Jerom, St. Onofrio, St. Hubert, and St. Francis receiving the stigmata. Huber.

CORTACHA, or **CORGATHA**, in *Ancient Geography*, a town of India, on the other side of the Ganges. Ptolemy.

CORTAN, in *Commerce*, a Spanish measure in Catalonia, 12 of which make a quartera, which is two bushels

English measure. Sixteen cortans make a larga of wine or brandy, or about 30 gallons English, being equal to 12 arrobas.

CORTE, **CESARE**, in *Biography*, a Genoese painter of some eminence, was born in the year 1550. After having received the rudiments of his art from his father Valerio, a scholar of Titian, and an excellent painter of portraits, but ruined in the pursuit of the philosopher's stone, he was placed under the tuition of Luca Cambiasi; and though he never equalled that great artist, he is considered one of his best disciples. He was much employed in cabinet pictures and portraits, and sometimes executed larger works. In the church of St. Piero, at Genoa, is an altar-piece of this master, representing the Tutelar Saint at the foot of the Madonna, with surrounding angels, which is delicately designed, and well coloured. The latter part of his life was miserably spent in the inquisition, where he died about 1613. He had a son named Davide Corte, who was an excellent copyist, and who died of the plague in the year 1657. Lanzi. Storia Pittorica.

CORTE, in *Geography*, a town of France, in the island of Corsica, in the department of the Golo, is the chief place of a district, which, upon an extent of 1445 kilometres, contains a population of 35,342 individuals. Corte itself counts 2042 inhabitants. It is built on an eminence, and has a subprefect and a court of justice. The soil of the district is uncommonly fertile. It produces wheat, wine, and olives. There is also much salt made.

Corte is almost in the centre of the island, 30 miles S. E. of Calvi; 33 S. W. of Bastia. N. lat. 42° 12'.

CORTE Maggiore, a town of Italy, in the duchy of Piacenza, six miles W. of Piacenza.

CORTEAU, an engine of war among the ancients, of which, however, there is no good account on record.

CORTEGANA, in *Geography*, a town of Spain, in the province of Andalusia; 38 miles N. W. of Seville.

CORTELLAZZO, a small island near the S. E. coast of the island of Sardinia, on the N. side of the gulf of Cagliari.

CORTEMIGLIA, a small town of France, in the department of the Tanaro, which was formerly part of Piedmont, in Italy, and belonged to the king of Sardinia. Cortemiglia has 1990 inhabitants, and is the chief place of a canton, composed of 19 communes, and containing 13,304 inhabitants.

CORTES, **FERNANDO**, in *Biography*, an enterprising and successful Spanish commander in the subjugation of Mexico, was born at Medellin, a small town of Estremadura, in the year 1485, and descended of a noble family of very moderate fortune. His parents, desirous him for the profession of the law, sent him to the university of Salamanca; but study being ill-suited to his ardent and restless genius, he soon left the university, and returning to his native town, devoted himself to active sports and martial exercises. His temper being impetuous and overbearing, and his habits dissipated, his father was glad to gratify his inclination by sending him abroad as an adventurer in arms. The scene to which his views were directed was America; and, in the year 1504, he landed at St. Domingo, where, under the patronage of Ovando, the governor of Hispaniola, who was his kinsman, he was soon advanced to several honourable and lucrative stations. His ambition, however, was not satisfied; and therefore, in 1511, he obtained permission to accompany Diego Velasquez in an expedition to Cuba. In this service he distinguished himself so much, that he received an ample concession of lands and of Indians, the usual recompence bestowed upon adventurers in the

New World. Cortes, naturally ardent and active, displayed other qualities, which adapted him for difficult and hazardous enterprises. With calm prudence in concerting his schemes, and persevering vigour in executing them, he combined the art of gaining the confidence and governing the minds of those with whom he was concerned. To these superior accomplishments, he added others of an inferior kind, that are suited to strike the vulgar, and command their respect: a graceful person, an engaging aspect, singular address in martial exercises, and a robust constitution capable of enduring any fatigue. Thus qualified, Cortes was selected as the most proper person for conducting the projected invasion of Mexico; and, as soon as he received his commission, he lost no time in making every necessary preparation for the enterprise. For this purpose he expended all his own funds, together with the additional money which he was able to raise, amounting in the whole value to about 1500*l.* sterling, in purchasing military stores and provisions, and in supplying the wants of those officers who were unable to equip themselves in a manner suitable to their rank. Cortes, however, at the commencement of his adventure, found, that in the suspicious and jealous temper of Velasquez, he had difficulties with which to contend, that required a very high degree of prudence and resolution, and these difficulties were enhanced in the progress of his undertaking. On the 18th of November 1518, he set sail from St. Jago de Cuba; but he had no sooner arrived at Trinidad, a small settlement on the same side of the island, before Velasquez made an attempt to deprive him of his commission. Cortes, however, had so far engaged the esteem and confidence of his troops, that, partly by soothing, and partly by intimidating Verdugo, a magistrate at Trinidad, to whom Velasquez had sent his instructions, he was allowed to depart without molestation from Trinidad. Cortes sailed for the Havannah in order to raise more soldiers, and to complete the victualing of his fleet. During his unavoidable stay in this place, Velasquez sent orders for arresting him, and for delaying the departure of the armament. Cortes, forewarned of the danger, had time to take precautions for his own safety. He announced to his troops the hostile intentions of Velasquez, and found that both his officers and soldiers who were intent on an expedition which flattered them with the hopes of glory and wealth, were determined to persevere; and accordingly they were unanimous in their intreaties that he would not abandon the important station to which he was so well intitled; offering, at the same time, to shed the last drop of their blood in supporting his authority. Cortes did not hesitate in complying with their wishes; swore that he would never desert them, and promised to conduct them without further delay, to that rich country, which had been so long the object of their thoughts and wishes. Every thing was now ready for their departure. The fleet consisted of eleven vessels, having on board 617 men, of whom 508 belonged to the land service, and 109 were seamen or artificers. With this slender and ill furnished train, Cortes set sail from Cuba, February 10, 1519, to make war upon a monarch, whose dominions were more extensive than all the kingdoms subject to the Spanish crown. Of religious enthusiasm, as well as avarice, these adventurers availed themselves on the present occasion; and therefore they displayed in their standards a large cross, bearing this inscription, "Let us follow the cross, for under this sign we shall conquer." Cortes sailed towards the island of Cozumel; and there redeemed Jerome de Aguilar, a Spaniard, who had been eight years a prisoner among the Indians, and who proved extremely useful as an interpreter. From Cozumel he proceeded to the

river of Tabasco, where failing to conciliate the good-will of the natives, by mild methods, he had recourse to violence; and at length induced them to acknowledge the king of Castile as their sovereign, and to grant him a supply of provisions, with a present of cotton garments, some gold, and 20 female slaves. Pursuing his course to the westward, he at length landed at St. Juan de Ulua, where he was accosted by a number of persons in a canoe, who approached his ship with signs of peace and amity. One of his female slaves, named Donna Marina, who perfectly understood the Mexican language, served as an interpreter on the occasion. Here he landed his troops, horses, and artillery, and fortified his camp: the natives assisting him in all his operations. In his first interview with two Mexican officers, who were deputed to inquire what were his intentions in visiting their coast, and to offer him any assistance which he might need for the prosecution of his voyage; Cortes informed them that he came as an ambassador from Don Carlos of Aultria, king of Castile, the greatest monarch of the East, with propositions of such moment, that he could impart them to none but the emperor Montezuma himself; and he therefore required them to conduct him, without loss of time, into the presence of their master. Whilst they hesitated in complying with his request, they endeavoured to conciliate his good-will by costly presents, the display of which served to increase the avidity of the Spaniards, and their eagerness to take possession of a country which abounded with such precious productions. The deputies dissuaded Cortes from visiting the capital; but he with a haughty determined tone insisted on his demand of being admitted to a personal audience of their sovereign. During the interview some Mexican painters were employed in delineating upon white cotton cloths figures of the ships, the horses, the artillery, the soldiers, and whatever else attracted their notice, as singular. These pictures, as Cortes was informed, were to be sent to Montezuma, in order to give him a better idea of the objects now presented to their view than any words could do: and therefore he resolved to make the representation more animated and interesting by exhibiting a spectacle which might give them and their monarch an awful impression of the extraordinary prowess of his followers, and the irresistible force of their arms. The trumpets were ordered to sound an alarm; the troops instantly formed in order of battle; the infantry performed such martial exercises as were best suited to display the effect of their different weapons; the horse by various evolutions gave a specimen of their agility and strength; and the artillery, pointed towards the thick wood which surrounded their camp, made dreadful havoc among the trees. The Mexicans were amazed, and at the explosion of the cannon many fled, and some fell to the ground; and Cortes found it difficult to compose their minds and preserve their confidence in their own safety. The painters put their fancy on the stretch in inventing figures and characters for representing the extraordinary things which they had seen. These pictures were dispatched to Montezuma, and Cortes sent along with them a present of some European curiosities. Although the capital, in which Montezuma resided, was above 180 miles from St. Juan de Ulua, Cortes's presents were carried thither, and an answer to his demands was received in a few days. As it was such as would be likely to irritate and not to satisfy him, the messengers introduced themselves, followed by a train of 100 Indians, loaded with presents sent by Montezuma. Among these were two large plates of a circular form, one of massive gold representing the sun, and the other of silver an emblem of the moon, which latter alone was in value about 5000*l.* sterling. These were accom-

accompanied with various other costly articles, consisting of golden ornaments and boxes of pearls and precious stones. When these presents were delivered, Cortes was informed that Montezuma would not consent that his troops should approach nearer to his capital, or even allow them to continue longer in his dominions. The Spanish general still insisted on his first demand; and Montezuma, though haughty, violent, and impatient of controul in his own temper, instead of falling on the Spaniards, whilst they were encamped on a barren unhealthy coast, without an ally, renewed his negociation. In order to account for this indifference and timidity, it is said an opinion prevailed universally among the Americans, that some dreadful calamity would befall their country by means of formidable invaders who should come from regions towards the rising sun. The superstition and credulity of the Mexicans represented the Spaniards as the instruments of that fatal revolution which they dreaded. Hence it ceases to be incredible, that a few adventurers, like Cortes and his attendants, should alarm the monarch of a great empire and all his subjects. Instead of taking effectual measures for expelling these invaders, Montezuma, after consulting his ministers, renewed his injunction in more positive terms, requiring them to leave the country; but this injunction was accompanied with a present of such value, as furnished a fresh inducement to remain there.

The Spaniards perceiving that hostile measures would become necessary, began to feel uneasiness; and the party of Velasquez disseminated jealousies and fears. In the mean while, Cortes took every measure, by kind attention and a liberal distribution of Mexican gold, to secure the affection and attachment of the soldiers. As he persisted in his demand of an audience on the part of the Mexican sovereign, the messenger quitted the camp with looks and gestures which expressed his surprize and resentment; and soon after the natives, who brought provisions to the camp, discontinued their visits. Every circumstance indicated the speedy commencement of hostilities; and dissatisfaction prevailed more and more in the Spanish camp. Cortes temporized and seemed to concur in the wishes of those, who were inclined to desist from the enterprise; and accordingly he issued orders, that the army should be in readiness to embark for Cuba. The disappointed adventurers exclaimed and threatened, and the whole camp was almost in an open mutiny. In an interview with their commander, they expressed their astonishment at the order which he had issued; declared their readiness to follow him with alacrity through every danger, in quest of those settlements and treasures which had been so long held out to their view; and at the same time, announced their resolution, if he chose to return to Cuba, to chuse another general, who would conduct them in that path of glory which he had not spirit to enter. The experiment succeeded; and Cortes, finding the spirit that prevailed among his troops, professed his readiness to conduct them, agreeably to their wishes, in the career of victory, to such independent fortunes as their valour merited. Upon this declaration, shouts of applause testified the excess of their joy. Cortes immediately began to execute his design. Having assembled the principal persons in his army, he elected, by their suffrages, a council and magistrates, in whom the government of the new colony should be vested; framing the new settlement upon the model of a Spanish corporation. All the persons chosen into office were most firmly devoted to Cortes. Combining the two operative principles of avarice and enthusiasm, he called his new settlement "Villa Rica de la vera Cruz," *i. e.* "The rich Town of the true Cross." When this new council was established, Cortes, after an artful harangue, laid the commission, which

he had received from Velasquez, upon the table, and, after kissing his truncheon, delivered it to the chief magistrate, and withdrew. The council, being well prepared for the measures that were to follow, did not long deliberate: the resignation of Cortes was accepted, and he was unanimously elected chief justice of the colony, and captain-general of the army; and the commission was made out in the king's name, with most ample powers. The soldiers, with eager applause, ratified the choice; the air resounded with the name of Cortes, and all vowed to shed their blood in support of his authority. Having imprisoned the leaders of the malcontents, who were the adherents of Velasquez, he secured the confidence of his attendants, by a seasonable and liberal distribution of Mexican gold among both his friends and his opponents.

At this time a message was brought to him from Zempoalla, a considerable town at no great distance, with an offer of friendship; accompanied with intimations that the cazique of this town hated Montezuma, and wished to be rescued from the oppression of his yoke. Cortes knew how to avail himself of this circumstance, and determined to march to Zempoalla. This town lay in his way to Quibablan, about 40 miles to the northward, and which, both on account of the fertility of the soil and commodiousness of the harbour, seemed to be a better situation for a permanent settlement than that where he was encamped. Here he marked out ground for a town; and aided by the Indians of Zempoalla and Quibablan, the place was soon in a state fit for habitation and capable of defence. The caziques of these two towns, emboldened by their alliance with the Spaniards, insulted the officers who appeared to levy tribute, and to demand a number of human victims in expiation of their guilt, for presuming to hold intercourse with strangers, who had been ordered out of his dominions by the emperor; committed them to prison, and prepared to sacrifice them to their gods. From this last danger Cortes rescued them. The caziques, having thus forfeited the protection of the emperor, attached themselves to the Spaniards; and their example was followed by the Totonagues, a fierce people, who inhabited the mountainous part of the country. Cortes now wished to have his authority confirmed by the king; and he therefore proposed that the magistrates of his colony should address a letter to him, recounting the services they had already performed; the extent, population, riches, and civilization, of the country which they had discovered; and their schemes and hopes for reducing the whole to subjection: together with their reasons for velling the supreme power, civil as well as military, in the hands of Cortes; and also requesting their sovereign to ratify what they had done by his royal authority. Cortes wrote in a similar strain. A present also, the richest of any that had hitherto been transmitted from the New World, accompanied these letters; and the chief magistrates of the colony were deputed to carry this present to Castile, with express orders not to touch at Cuba in their passage thither. While a vessel was preparing for this service, a conspiracy against Cortes was formed by some adherents of Velasquez; but it terminated by the treachery of one of their associates, who disclosed their design, when every thing was ready for execution. This conspiracy halted the accomplishment of a scheme, long formed by Cortes; which was that of destroying his fleet, so that he and his companions must either conquer or perish. His address gained their consent; and by an effort of magnanimity, unparalleled in history, 500 men voluntarily consented to be shut up in a hostile country, and having precluded every method of escape, left themselves without any resource but their own valour and perseverance.

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Cortes, however, was precipitated into actions inconsistent with the prudence that distinguished his character: for he commanded his soldiers to overturn the altars and to destroy the idols in the chief temple of Zempoalla, and in their place to erect a crucifix and an image of the Virgin Mary. The people witnessed this deed of sacrilege with astonishment and horror; the priests excited them to arms; and it required the masterly address of Cortes to appease the commotions without bloodshed.

On the 16th of August 1519, Cortes began his march from Zempoalla into the country, with 500 men, 15 horse, and 6 field-pieces. The rest of his troops he left as a garrison in Villa Rica. The cazique of Zempoalla furnished him with provisions, and with 200 Indians, called "Tamones," whose office was to carry burdens, and perform all servile labour. He also supplied Cortes with a body of troops, amounting to 400. When he arrived on the confines of Tlascala, he found the inhabitants hostile and preparing to oppose their invaders. When the Spaniards entered into the Tlascalcan territories, they were attacked with great intrepidity, and during 14 days they were exposed to almost uninterrupted assaults; but after three battles and many skirmishes, so imperfect were the military weapons of these people, nor one Spaniard was killed in the field. After several unavailing encounters, the fierceness of the Tlascalcan's abated, and they seriously inclined to peace. At length they yielded themselves as vassals to the crown of Castile, and engaged to assist Cortes in all his future operations. Cortes remained 20 days in Tlascala, reposing his troops after hard service, and concerting the plans of his future operations. The Tlascalcan's offered to accompany him in his march to Mexico, with all the forces of the republic, under the command of their most experienced captains. The intemperate zeal of Cortes was very near depriving him of all these benefits. Explaining to the Tlascalcan's some of the chief doctrines of the Christian religion, insisting upon their abandoning their own superstitions, and embracing the faith of their new friends, and mingling menaces with arguments, he at length excited the indignation of these people, who had long heard him with singular patience and candour; and they conjured him to desist, lest the gods should avenge on their heads the guilt of having listened to such a proposition. Cortes was proceeding to violence, but was restrained by the interposition of father Bartholomew de Olmedo, chaplain to the expedition. Accordingly he left the Tlascalcan's in the undisturbed exercise of their own rites, requiring only that they should desist from their horrid practice of offering human victims in sacrifice. Cortes, against the remonstrance of the Tlascalcan's, advanced towards Cholula, which had been an independent state, but had lately been subjected to the Mexican empire. Finding the inhabitants to be treacherous, and to be contriving his destruction, whilst they received him with seeming hospitality and kindness, he avenged himself without mercy, and slaughtered 6000 persons. From Cholula Cortes advanced directly towards Mexico, which was only distant 20 leagues; and as he proceeded, the discontents against the Mexican government, that were manifested by the people, encouraged his hopes. In descending from the mountains of Chalco, the vast plain of Mexico opened to their view, and presented the most beautiful prospect on the face of the earth; fertile and cultivated fields, a lake resembling the sea in extent, encompassed with large towns, and the capital city rising upon an island in the middle, adorned with its temples and its turrets. They were now fully satisfied that the country was rich beyond any conception they had previously formed of it; and they flattered

themselves that they should soon obtain an ample recompence for all their services and sufferings. No enemy had yet appeared to oppose their progress; and Cortes was almost at the gates of the capital, before the monarch had determined whether to receive him as a friend, or to oppose him as an enemy. The Spaniards marched forward, however, with great circumspection. At length, as they drew near the city, about 1000 persons, apparently of distinction, came forth to meet them, adorned with plumes, and clad in mantles of fine cotton. They announced the approach of Montezuma, who advanced in the midst of a great number of attendants, with extraordinary magnificence and pomp, in a chair or litter richly ornamented with gold, and feathers of various colours. Cortes, when he drew near, dismounted and advanced towards him in a respectful posture. Montezuma, at the same time, alighted from his chair, and walked over the cotton cloths which covered the street. After mutual salutations were reciprocally paid and returned, Montezuma conducted Cortes to the quarters allotted for his reception, and politely took his leave.

In this new habitation, surrounded by a stone wall with towers at proper distances, the first care of Cortes was to take precautions for his security by planting the artillery so as to command the different avenues which led to it, by appointing a large division of his troops, to be always on guard, and by posting centinels at proper stations. In the evening Montezuma returned with the same pomp as in the first interview, and brought rich presents to Cortes and to his officers, and a so to the private men. In a long conference which ensued, Cortes learned what was the opinion of Montezuma with respect to the Spaniards, and how he supposed Cortes and his followers were the persons whose appearance the Mexican traditions and prophecies taught them to expect, and that he was disposed to receive them as relations of the same blood and parentage. Cortes, in reply, extolled the dignity and power of his sovereign, and announced his intention in sending him into that country, favouring as much as possible the idea which Montezuma had formed concerning the origin of the Spaniards. After some days spent in viewing the city, he revolved in his mind what conduct in his situation it was proper for him to pursue; and all circumstances considered, he determined, as the most politic measure to seize Montezuma in his palace, and to carry him as a prisoner to the Spanish quarters. When this bold measure was proposed to his officers, the timid started many difficulties and objections; but the more intelligent and resolute approved of it; and it was agreed instantly to make the attempt. At his usual hour of visiting Montezuma, Cortes, accompanied by five principal officers, and as many trusty soldiers, went to the palace; and they were followed by 30 chosen men: the rest of the troops were properly distributed and under arms ready to fall forth on the first alarm. Cortes, admitted to an audience, addressed Montezuma in the language of complaint and reproach; and Montezuma attempted to vindicate himself from accusation. The Spanish general thought it necessary, that Montezuma, in order to convince his followers that he entertained no hostile intentions, should leave his own palace, and take up his residence in the Spanish quarters. After much hesitation and remonstrance, and under the influence of apprehensions concerning his own safety, the emperor complied. In the Spanish quarters, to which he was conveyed amidst the murmurs of the people, he was treated with ceremonious respect. After some time Cortes entered his apartment, accompanied by a soldier with a pair of fetters; and addressing him with a stern countenance, told him that as the persons who were about to suffer for attacking the Spaniards near

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Villa Rica, had charged him as the cause of the outrage committed, it was necessary that he likewise should make atonement for that guilt; and he commanded the soldier to clap the fetters on his legs. The monarch sunk under the indignity, and his attendants bathed his feet with their tears. At length Cortes returned from the execution of the persons that had been found guilty with a cheerful countenance, and ordered the fetters to be taken off. This seems to have been, on the part of Cortes, a wanton exercise of power; though it has been vindicated on the ground of policy: as it tended to impress the minds of the Mexicans with a persuasion, that shedding the blood of a Spaniard, of which the persons now executed had been guilty, was the most heinous of all crimes; and nothing appeared better calculated to establish this opinion, than to condemn the first Mexicans who had ventured to commit it to a cruel death, and to oblige their monarch himself to submit to a mortifying indignity, as an expiation for being accessory to their guilt. During the six months of Cortes's abode at Mexico, Montezuma continued in the Spanish quarters with apparent satisfaction and tranquillity; and whilst he was thus under the power and, as it were, in the custody of the Spanish general, Cortes enjoyed peculiar advantage for examining the state of the country, and acquainting himself with the disposition of the inhabitants. He also by these means obtained such a command of the lake as might ensure a retreat, if either from levity or disgust, the Mexicans should take arms against him, and break down the bridges or causeways. Cortes urged Montezuma to acknowledge himself a vassal of the king of Spain, to hold his crown of him as superior, and to subject his dominions to the payment of an annual tribute. Such was the influence of the Spanish general over the Mexican monarch, that with this requisition, degrading as it was, he was so obsequious as to comply. This act of submission and homage was executed with all the formalities which the Spaniards were pleased to prescribe: and as a profession of fealty and homage, it was accompanied with a magnificent present to his new sovereign; and after his example his subjects also made very liberal contributions. The whole amount of the treasure which the Spaniards had received, by gift or extortion, from Montezuma and his subjects, is estimated at six hundred thousand pesos, which was divided by Cortes in the following manner: a fifth was set apart as a tax due to the king; another fifth was allotted to Cortes, as commander in chief; the sums advanced by Velasquez, Cortes, and some of the officers, towards defraying the expence of fitting out the armament, were also deducted; and the remainder was divided among the army, in proportion to the different ranks. After so many defalcations the share of a private man did not exceed 100 pesos. This occasioned great murmuring among the soldiers, so that it required all the address of Cortes, and no small exertion of his liberality to appease them. Montezuma, though he complied in many instances with the requisitions and wishes of Cortes, was inflexible on the subject of religion. When the Spanish commander found all his attempts to shake the constancy of Montezuma ineffectual, he was so much enraged at his obstinacy that in a transport of zeal he led out his soldiers to throw down the idols in the great temple by force. But the priests taking arms in defence of their altars, and the people crowding to support them, Cortes was obliged to desist and his prudence overruled his zeal. The Mexicans, ever since the confinement of their sovereign, had been meditating how they might expel or destroy the Spaniards; and they thought themselves under a kind of sacred obligation to avenge their insulted deities. Montezuma, having called

Cortes into his presence, observed to him that, as all the purposes of his embassy were fully accomplished, the gods had declared their will, and the people signified their desire, that he and his followers should instantly depart out of the empire. With this he required them to comply, or unavoidable destruction would fall suddenly on their heads. Cortes replied, that he had already begun to prepare for returning to his own country; but as he had destroyed the vessels in which he arrived, some time was requisite for building other ships. This appeared reasonable. In this state of anxiety and suspense, a Mexican courier arrived with an account of some ships having appeared on the coast. This was an armament fitted out by Velasquez at Vera Cruz, and instead of bringing the aid they expected, threatened them with utter destruction. Velasquez had received information concerning Cortes by means of the vessel that had been dispatched for Spain, and which contrary to orders had touched at Cuba. He immediately exerted himself in completing an armament, consisting of 18 ships, having on board 80 horsemen, 800 foot soldiers, of whom 80 were musketeers, and 120 crossbowmen, together with a train of 12 pieces of cannon. The command of this armament was entrusted with Pamphilo de Narvaez, who had instructions to seize Cortes and his principal officers, to send them prisoners to Velasquez, and then to complete the discovery and a conquest of the country in his name. Cortes was alarmed, and not without reason, by the news of the arrival of Narvaez; and more especially when he heard, that several provinces, in his interest, began to revolt from him, and to regard Narvaez as a deliverer no less able than willing to save them. The measures which it would be prudent for him to adopt required the utmost deliberation. After revolving every scheme that presented itself to his mind with deep attention, he adopted that, the execution of which was most hazardous; but which, if successful, would prove most beneficial to his country; and with the decisive intrepidity suited to desperate situations, he determined to make one bold effort for victory under every disadvantage, rather than sacrifice his own conquests and the Spanish interest in Mexico. When his attempts for negotiating with the followers of Narvaez had failed, he determined to advance towards an enemy whom he had in vain endeavoured to appease. Accordingly, having left 150 men in the capital to guard the city, the wealth he had amassed, and the person of the imprisoned monarch, he advanced with a force not exceeding 250 men, towards Zempoalla, of which Narvaez had taken possession. Having conciliated some of Narvaez's officers by liberal presents, he attacked him in the night, and availing himself of several advantages that had occurred, he obtained a decisive victory; so that before morning the officers of Narvaez capitulated, and the soldiers laid down their arms, and submitted quietly to their conquerors. Soon after this victory Cortes received information from the capital, that the Mexicans had taken arms against the Spaniards, and therefore he hastened back with all his forces as rapidly as possible; and in his march he was joined at Tlascala by 2000 chosen warriors. The Mexicans had made no preparation for resisting his entrance; but immediately on his arrival he was admitted into the city without molestation, and took quiet possession of his ancient station. Emboldened by his success he treated Montezuma with neglect and his subjects with insult; and thus provoked the Mexicans to renew their hostility. The number who took up arms was considerable, and their courage undaunted. One body of troops succeeded another amidst bloodshed and slaughter, so that the abilities and experience of Cortes, seconded by the valour of his soldiers, were hardly sufficient to defend the fortifications that sur-

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rounded the post where the Spaniards were stationed. Cortes prepared for a sally, with such a considerable force as might either drive the enemy out of the city, or compel them to listen to terms of accommodation. He attacks them, however, without success; and though vast numbers of the Mexicans fell, the Spaniards were at length obliged to retire, 12 soldiers having been killed and 60 wounded. In another unsuccessful sally, the general himself was wounded in the hand. When the Mexicans approached to renew the assault, Montezuma was presented to their view; and he addressed them with every argument that could mitigate their rage, or persuade them to cease from hostilities. As soon as he had ended his discourse, the enraged Mexicans poured in flights of arrows and volleys of stones with such violence on the ramparts, as to wound the unhappy monarch and strike him to the ground. Cortes followed him to his apartment in order to console him under his misfortune; but perceiving how low he was sunk, his haughty spirit revived, and he scorned to prolong his life after this last humiliation. Snatching the bandages from his wounds in a transport of rage, and refusing to take any nourishment, he soon ended his wretched days; refusing with disdain all the solicitations of the Spaniards to embrace the Christian faith. Upon the death of Montezuma, Cortes lost all hopes of bringing the Mexicans to an accommodation, and prepared for a retreat. But in accomplishing his design, he was engaged in new conflicts. At length they determined to retire secretly in the night; but they had not proceeded far, before the Mexicans discovered them and made dispositions for a formidable attack. When morning dawned, it discovered to Cortes, who had arrived at Tacuba with those of his followers that had survived, his shattered battalion, reduced to less than half its number, in a dejected and wounded condition; and the sight caused the tears to trickle from his eyes, which his soldiers observed with satisfaction, concluding that while attentive to the duties of a general he was not insensible to the feelings of a man. Having retired to an adjacent temple for the repose and refreshment of his troops, exhausted with fatigue, he there deliberated what course to pursue; and at length determined to march towards the Tlascalan territories. In their way thither they encountered many attacks; but upon their arrival, they were received with tenderness and cordiality. Having obtained several reinforcements, he mustered 550 infantry, of which 80 were armed with muskets or cross-bows, forty horsemen, and a train of 9 field pieces. At the head of these, accompanied by 10,000 Tlascalans and other friendly Indians, Cortes began his march towards Mexico, on the 20th of December 1520, six months after his disastrous retreat from that city. As he advanced thither, he found that the Mexicans were prepared to oppose his progress. He therefore took possession of Tezenco, the second city of the empire situated on the banks of the lake, about 20 miles from Mexico. Here he established his head-quarters; and deposing the chief who was at the head of the community, he placed another cazique in his room, who, together with his adherents, served the Spaniards with inviolable fidelity. Here he employed himself with singular assiduity in preparing a naval armament of 13 brigantines, for aiding his future operations; and in the mean while, four ships arrived at Vera Cruz from Hispaniola, with 200 soldiers, eight horses, two battering rams, and a considerable supply of ammunition and arms. Cortes therefore became impatient to commence the siege of the capital in form, and he determined to attack it from three different quarters; from Tezenco on the east side of the lake, from Tacuba on the west, and from Cuycoc towards the south. After repeated and

severe conflicts, in one of which Cortes himself was captured and wounded, though immediately rescued from six Mexican officers, by two of his soldiers, and the loss of several of his men, some of whom were sacrificed with barbarous triumph to the god of war, he found himself, according to his own account, at the head of 150,000 Indians, by whose assistance he was enabled to vary his system of attack; and while his brigantines kept possession of the lake, to shut up the avenues to the city by land. In consequence of these measures, not only the people in general, but some even of the highest rank felt the utmost distresses of want. The spirit of the emperor Guatimozin, however, still remained unsubdued; and rejecting every overture of peace from Cortes, resolved not to survive the ruin of the city. The Spaniards continued their progress, and made a secure lodgment in its centre, three-fourths of it being now reduced and laid in ruins. At length Guatimozin was ordered to attempt an escape, but in his endeavours for this purpose, he was taken prisoner, and with dignified composure, surrendered himself into the hands of his conqueror, requesting only that no insult might be offered to the empress or his children. As soon as the fate of their sovereign was known, the resistance of the Mexicans ceased, and Cortes took possession of that small part of the capital which remained undestroyed. Thus terminated, Aug. 21, 1521, the siege of Mexico, after having continued 75 days: the most memorable event in the conquest of America. As Guatimozin, aware of his impending fate, had ordered a great part of the riches amassed by his ancestors, to be thrown into the lake; and the Indian auxiliaries, during the progress of the siege, had carried off the most valuable part of the spoil, the remaining booty was so small, when a division took place, as to occasion great discontent among the conquerors. In order to check this evil, Cortes perpetrated a deed which stains the glory of all his great actions. He ordered Guatimozin, and his chief favourite, to be tortured, in order to force from them a discovery of the royal treasures, which they were supposed to have concealed. The emperor endured his sufferings with the invincible fortitude of an American warrior; till at length Cortes, ashamed of a scene so horrid, rescued the royal victim from the hands of his tormentors, and prolonged a life reserved for new indignities and sufferings.

The fate of the capital decided that of the empire; and the provinces submitted one after another to the conquerors. Upon this Cortes formed new schemes of discovery, which were afterwards completed by Ferdinand Magalhaen, or Magellan. See his article.

Whilst Cortes was acquiring such vast territories for his native country, and preparing the way for future conquests, he was regarded as an undutiful and rebellious subject; his conduct in assuming the government of New Spain, was declared to be an irregular usurpation, in contempt of royal authority, and a commission was issued for suspending him, seizing his person, confiscating his effects, making a strict scrutiny into his proceedings, and transmitting the result to the council of the Indies, of which Fonseca, bishop of Burgos, was president. Cortes took secret measures for defeating the effect of this commission; and in May 1522, dispatched deputies to Spain, with a pompous account of the success of his arms, further specimens of the productions of the country, and rich presents to the emperor, as earnest of future contributions from his new conquests; requesting, in recompence for his services, the approbation of his proceedings, and that he might be entrusted with the government of those territories, which his conduct, and the valour of his followers, had added to the

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crown of Castile. The public voice declared warmly in favour of his pretensions, and he was appointed by the emperor Charles V., captain-general and governor of New Spain; in consequence of which appointment, he endeavoured by new schemes and arrangements to render his conquest a secure and beneficial acquisition to his country. The emperor at the same time appointed certain commissioners to receive and administer the royal revenue there, with independent jurisdiction. These commissioners sent home unfavourable accounts of the character and conduct of Cortes, which made such an impression on the Spanish ministers, and by their means on the mind of their master, that a new commission was granted, with powers to investigate the truth of these allegations, to seize the person of Cortes, if that measure should be found expedient, and to send their prisoner to Spain. The execution of this commission was prevented by the death of Ponce de Leon, with whom it was entrusted; and Cortes, though deeply wounded with this return for his services, endeavoured to maintain his station, and to recover the confidence of the court. The apprehensions of Charles and his ministers increased; and in 1528, a new commission of inquiry was issued, with more extensive powers. Cortes was extremely indignant; but instead of asserting his own rights against his ungrateful countrymen, and with a bold hand seizing that power which the courtiers meanly accused him of coveting, as some of his desperate followers advised, he repaired directly to Castile, and committed himself and his cause to the justice and generosity of his sovereign. Here he was received in the most respectful manner, and the order of St. Jago, the title of marquis del Valle de Guaxaca, and the grant of a vast territory in New Spain, were successively bestowed upon him; and as his manners were correct and elegant, the emperor admitted him to the same familiar intercourse with himself that was enjoyed by noblemen of the first rank. Cortes, however, though dignified with new titles, returned to Mexico in 1530, with diminished authority. The military department, with powers to attempt new discoveries, was left in his hands; but the supreme direction of civil affairs was placed in a board called "the Audience of New Spain;" and at a subsequent period, a nobleman of high rank was sent thither as viceroy, to take the government into his own hands.

The division of power in New Spain, became the source of perpetual dissension, which embittered the life of Cortes, and thwarted all his schemes. Nevertheless, he projected new discoveries, and formed various schemes for that purpose. Having entrusted the execution of some of his plans to others, who were unsuccessful, he determined, in 1536, to undertake in person the conduct of an armament, with which, after enduring incredible hardships, and encountering various dangers, he discovered the large peninsula of California, and surveyed the greatest part of the gulf which separates it from New Spain. Dissatisfied and disgusted, on a variety of accounts, he once more sought redress in his native country. Accordingly he returned thither in 1540; but his reception was very different from that which gratitude, and even decency, ought to have secured for him. As no farther services could be expected from him in his declining years, he was treated sometimes with neglect, sometimes with insolence. After several years his grievances received no redress, and his claims were ineffectually urged, although from time to time he renewed his application to ministers and judges; and at length, broken down by age, and the vexation of disappointment, he ended his days, December 2, 1547, in the 62d year of his age. "Envidied by his contemporaries, and ill-requited by the court which he served, he has been admired and celebrated by succeed-

ing ages. Which has formed the most just estimate of his character, an impartial consideration of his actions must determine." Robertson's History of America, vol. ii. See MEXICO.

CORTES, in *Geography*, a town of Spain, in Navarre; 7 leagues from Tudella.

CORTES, in *Political Economy*, a term purely Spanish, properly signifying the *courts*, i. e. the states or assembly of the states, in Spain. In this sense the term has been of ancient use in that kingdom. In Arragon, though the form of government was monarchical, (see ARRAGON,) yet the genius and maxims of it were purely republican; and the real exercise of power was vested in the cortes or parliament of the kingdom, whilst the sovereign himself retained the mere shadow of power. This supreme assembly was composed of four different arms or members, viz. the nobility of the first rank; the equestrian order, or nobility of the second class; the representatives of the cities and towns, whose right to a place in the cortes, if the historians of Arragon may be credited, was coeval with the constitution; and the ecclesiastical order, composed of the dignitaries of the church, together with the representatives of the inferior clergy. No law could pass in this assembly, without the assent of every single member who had a right to vote. Without the permission of the cortes, no tax could be imposed; no war could be declared; no peace concluded; no money could be coined; nor any alteration be made in the current specie. The power of rescinding the proceedings of all inferior courts, the privilege of inspecting every department of administration, and the right of redressing all grievances, belonged to the cortes: and those who were aggrieved addressed the cortes, not in the humble tone of supplicants, but with the boldness of persons who demanded the birth-right of freemen, and required the guardians of their liberty to decide on the points referred to their consideration. This sovereign court was held for several centuries every year; but, in consequence of a regulation introduced about the beginning of the 14th century, it was convoked from that period only once in two years. After it was assembled, the king had no right to prorogue or dissolve it, without its own consent; and the session continued 40 days. See JUSTIZA.

In the kingdom of Castile also, the legislative authority resided in the cortes, which was composed of the nobility, the dignified ecclesiastics, and the representatives of the cities. The assembly of the cortes in Castile was very ancient, and seems to have been coeval with the constitution. The members of the three different orders, who had a right of suffrage, met in one place, and deliberated as one collective body; the decisions of which were regulated by the sentiments of the majority. The right of imposing taxes, of enacting laws, and of redressing grievances, belonged to this assembly; and in order to secure the assent of the king to such statutes and regulations as were deemed necessary or beneficial to the kingdom, it was usual in the cortes to take no step towards granting money until all business relative to the public welfare was concluded. The representatives of cities seem to have obtained a seat at a very early period in the cortes of Castile, and soon acquired such influence and credit as were very uncommon at a time when the splendour and pre-eminence of the nobility had eclipsed or annihilated all other orders of men. The number of members from cities bore such a proportion to that of the whole collective body, as rendered them extremely respectable in the cortes; and the early admission of the representatives of cities into this assembly seems to have been one source of the liberty that pertained to the constitution of Castile, as well as to that of Arragon. In Catalonia, as well as in Castile, the cortes were composed of three estates. The commons were introduced.

introduced into this assembly of Catalonia A. D. 1283; and is to that of Arragon in 1137. In Navarre, the cortes resembled that of Castile. Robertson's Hist. ch. v. vol. i.

CORTESI, PADRE GIACOMO, in *Biography*, called likewise *Borgognone*, a most esteemed painter of battles, was born at St. Hippolite in Franche Compté, in the year 1621. He derived the first principles of the art from his father, Gios Cortesi, a painter of little repute. At the age of fifteen, following the bent of his inclination for travelling, he went to Milan, where good fortune made him known to Baron Vatteville Borgognone, an officer of rank in the service of the king of Spain, who took him into his house, and treated him with the greatest kindness, whence our artist was afterwards called *Il Borgognone*. The consequence of this connection was, that Giacomo for some time embraced the profession of arms, although he still continued occasionally to exercise himself in drawing and painting. His natural genius, however, at length prevailed; and stimulated by the great reputation which Guido and Albano then enjoyed at Bologna, he left Milan, and repaired to that city. The talents of our young artist were sufficient to recommend him to the courteous Guido, who received him into his house, and instructed him for several months; but although he made rapid advances in the art, it was not until he had seen the celebrated battle of Constantine at Rome that the peculiar bent of his genius developed itself. From this time he principally devoted himself to the painting of battles, which he executed on a small scale, with a variety, a boldness, and a truth of representation, such as no one who had not, like himself, been an eye-witness of such scenes, could have effected. Upon the death of his wife, about the year 1655, he entered into the order of the Jesuits; but his clerical avocations were not permitted to interfere with the exercise of his favourite art. He died at Rome in 1676.

There are a few etchings of battles engraved by the hand of this artist with prodigious spirit. Baldinucci. Huber.

CORTESI, GUGLIELMO, brother to the last mentioned artist, was born at St. Hippolite in 1628, and, like his brother, at an early period, repaired to Italy, to perfect himself in historical painting. He became the scholar of Pietro da Cortona, and acquired sufficient reputation to be employed in several considerable altar-pieces at Rome. But although Cortona was his master, the style of Carlo Maratta was that to which he more especially adhered; to which he sometimes succeeded in uniting the force of Guercino, and something of the design of the Caracci. The Crucifixion of St. Andrew in the church of that saint at Monte Cavallo, and the Battle of Joshua in the palace of the pope, in its vicinity, are amongst his most esteemed works. He died at Rome in 1709. Lanzi. Ill. Pittor. Huber.

CORTESIA, in *Botany*, Cav. Pl. 377. Class and order, *pentandria monogynia*.

Gen. Ch. Cal. Perianth one-leaved, ten-toothed, permanent. Cor. monopetalous, with five roundish segments. Stam. Filaments five. Pist. Germ superior, egg-shaped; style filiform; stigmas two, peltate. Peric. Berry egg-shaped, two-seeded. Seeds flattened on one side.

Sp. C. *cuneiformis*. A much-branched shrub. Leaves alternate, wedge-shaped, a trifid. Flowers yellowish, solitary, often terminal. A native of the neighbourhood of Buenos Ayres.

CORTEX, or CORTICAL SUBSTANCE, in *Anatomy*, is the reddish-grey substance, which, generally speaking, is confined to the external surface of the brain. See BRAIN.

CORTEX, in *Vegetable Anatomy*, the Bark of Plants, strictly so called, is situated betwixt the cellular integument

and the wood. Its general structure and appearance have been amply explained in a former part of this work under the term BARK; an account of its physiology only remains to be given.

That the *liber* or inner layer of the bark secreted matter for the formation, not only of a new *liber* for the ensuing season, but also of a layer of wood, is clearly proved, notwithstanding Mirbel's doubts, by the experiment of Du Hamel. The late Dr. Hope, Professor of Botany at Edinburgh, performed an experiment, if possible still more decisive, upon a branch of willow 3 or 4 years old. "The bark was carefully cut through longitudinally on one side for the length of several inches, so that it might be slipped aside from the wood in the form of a hollow cylinder, the two ends being undisturbed. The edges of the bark were then united as carefully as possible, the wood covered from the air, and the whole bound up to secure it from external injury. After a few years, the branch was cut through transversely. The cylinder of bark was found lined with layers of new wood, whose number added to those in the wood from which it had been stripped, made up the number of rings in the branch above and below the experiment." The substance of this account was given to Dr. Smith by the present Professor Hope. See *Introduction to Botany*, 35.

In describing the CIRCULATION of the SAP we have shewn that the nutritious fluids pass along the sap-vessels of the young wood into the leaves, and are from thence returned into the *liber*, which is thus enabled to perform its important functions. Hence if a wound be made in the bark of a tree, and a circular portion removed, the upper edge only of that wound will swell, and the bark gradually extend itself, so as in time to cover the wood again, while the portion of bark below, as far as the next leaf or bud, shews no signs of life. If the wound be only partial, and not extending all round the branch, its sides, supplied from above, will also gradually approach each other. If the dead surface of wood be carefully removed, and the living part secured, by a proper covering or plaster, from the injuries of the atmosphere, the bark will speedily close up the wound entirely, as the late Mr. Forsyth and others have proved. It seems that the bark is destined to receive and to apply to use that vegetable fluid, or sap, upon which essential changes have already been made by air, light, and heat, in its passage through the leaves, rather than to operate any great changes itself in such fluid. Nevertheless, after the woody matter is deposited from it in the form of a new *liber*, and new *alburnum*, or layer of new unhardened wood, the remainder unquestionably undergoes some further changes, even in the *cortex* itself. An examination of the more aromatic barks, which abound in essential oils or other secreted fluids of a peculiar nature, affords room to believe that such fluids are scarcely perfected in the cortical layer of the present year, but are more than one or even two seasons in coming to maturity. Hence the qualities of certain plants exist in the greatest perfection in their bark, as the bitter and allringent principles of the *Cinchona*, and of various Willows, Oaks; the aromatic oil of the Cinnamon; the resin of the Fir and Juniper, &c. Nor does this hold good with respect to trees only. Perennial herbaceous plants have frequently a very distinct bark to their roots, abundant in secreted fluids. Even annual or biennial roots, as the Carrot and Parsnep, are furnished occasionally with a very thick bark, though of but one layer, nor indeed are the layers in the barks of perennial roots commonly defined with precision like those of trees.

The texture, appearance, and qualities of the fibres of the bark, in different species or natural orders of vegetables, differ no less than its secreted fluids. Thus the Flax is pre-eminently

eminently distinguished for its fineness, and the hemp for its strength. The bark of the Mallow tribe in general affords a useful thread of a more or less perfect kind. The *Daphne* and its allies, among which is the lace-bark of Jamaica, are remarkable for the pure silky whiteness of their cortical threads, which however are deficient in tenacity. S.

CORTEX *Eleutheria*. See *Thus Judeorum*.

CORTEX *Peruvianus*, called also *quinquina*, *kinkinna*, *quinaquina*, *pulvis patrum*, and popularly the *Jesuit's bark*, is the bark of a tree, growing in the West-Indies, called by the Spaniards *palo de calenturas*, q. d. *fever-wood*; by reason of its extraordinary virtue in removing all kinds of intermitting fevers and agues. See *Cinchona*.

CORTEX *Simarubæ*. See *Quassia*.

CORTEX *Winteranus*, or *Winteri*, the bark of a tree brought from the streights of Magellan, by captain Winter, in his voyage with sir Francis Drake, in 1579. Clusius calls the tree, *Magellanica aromatica arbor*. See *CANELLA*, and *WINTERA Aromatica*.

CORTEZ, GREGORY, in *Biography*, descended from an ancient family at Modena, was born towards the end of the 15th century. Early in life he distinguished himself by his knowledge of the classics, and the canon and civil law. He was patronized by John de Medici, afterwards pope Leo X., but disliking the juridical employment, he determined to give the whole bent of his mind to theology, and accordingly took the habit of the Benedictine order, in which he rose successively to the most honourable offices, and in 1542 was made a cardinal. On this occasion he received very flattering congratulations from persons of the highest rank in the college, which proved to himself and the world in how high estimation he was held by his contemporaries. His conduct through life merited the eulogies which his virtues and talents had called forth in this instance. He died at Rome in the year 1548. He was an excellent Latin writer, and was author of many works, of which the chief are "De Theologica Institutione Liber;" "De Potestate Ecclesiastica Tractatus Liber," and "Epistolarum Familiarium Liber." His last work, which was printed at Venice 25 years after the author's death, contains his correspondence with the learned men of his own age. Moreri.

CORTICATA, in *Ancient Geography*, an isle of the ocean, on the coast of Spain, according to Pliny. F. Hardouin thinks that it is the modern isle of Salcora. On the chart of M. d'Anville it is marked near the coast, and to the W. of *Magnus Portus*.—Also, a town of Spain, in *Bætica*, placed by Ptolemy in the country of the Turdetani.

CORTICELLI, SALVATORE, in *Biography*, a Bolognese, who in the early part of life was professor of the belles lettres in the college of St. Paul, Bologna. He became a monk, and was in process of time provincial of his order. He was held in high estimation by pope Benedict XIV.: and as an author he is known and celebrated for an "Italian Grammar," written upon the most methodical principles; and for a work entitled "L'Eloquenza Italiana," intended to illustrate the higher departments of the belles lettres. Corticelli died about the year 1770.

CORTICOS, in *Geography*, a town of Portugal, in the province of *Traf los montes*; 3 leagues E. of *Mirandella*.

CORTLAND, a township of America, in the N. part of the county of W. Chester, on the E. bank of Hudson river, in the state of New York, containing 1932 inhabitants, of whom 66 are slaves. Of its inhabitants in 1796, 305 were electors.

CORTONA, PIETRO DA, in *Biography*. See *Berretini*.

CORTONA, in *Ancient Geography*, lay S. of *Arrentium*, and at a small distance N.W. of the lake *Trafineus*. It is

supposed to have been built on the ruins of an ancient town called *Corythus*. It had kings before the Romans. It is known in the march of Hannibal, who passed between deserts near this town.—Also, a town of Spain. Pliny.

CORTONA, in *Geography*, a town of Italy, in the duchy of Tuscany, the see of a bishop, suffragan of Florence, with a celebrated academy. It contains 7 churches, adorned with beautiful paintings, and 12 convents of both sexes. The walls were constructed of large blocks of stone, without cement, many of which are still in good preservation; 30 miles S.E. of Sienna. N. lat. 43° 14'. E. long. 12° 4'.

CORTONESE, PIETRO PAOLO, in *Biography*. See *Gobbo*.

CORTORIACUM, in *Ancient Geography*, *Courtrai*, a town of Gaul, in *Belgica Secunda*, N. of *Turniacum*.

CORTUOSA, a town of Italy, in *Etruria*; belonging, according to *Livy*, to the territory of the *Tarquins*.

CORTUSA, in *Botany*, (named by *Matthioli*, in honour of J. A. Cortusus, professor of Botany at Padua.) *Linn. Gen.* 198. *Schreb.* 259. *Willd.* 294. *Lam.* III. 278. *Gært.* 283. *Juss.* 96. *Vent.* 2. 290. Class and order, *pentandria monogynia*. *Nat. Ord. Preciz*, *Linn. Lyfsmachia*, *Juss.*

Gen. Ch. Cal. Perianth five-cleft, small, spreading, permanent; segments acute. *Cor.* monopetalous, funnel-shaped; tube short; border five-parted, ample; throat with an elevated ring, pervious. *Stam.* Filaments five, very short, attached to the tube; anthers oblong, erect. *Pist.* Germ. superior, egg-shaped; style filiform, longer than the corolla; stigma simple. *Peric.* Capsule ovate-oblong, furrowed on each side, one-celled, half five-valved. *Seeds* numerous, roundish, somewhat angular, dotted, fixed to a cylindrical free central receptacle.

Eff. Ch. Corolla funnel-shaped, throat pervious. Capsule two-furrowed, one-celled.

Sp. 1. C. Matthioli. *Linn. Sp. 1. Mart. 1. Lam. 1. Ill.* 99. *fig. 1. Willd. 1. Gært. tab. 50. fig. 7. Allon. flor. ped.* 340. *tab. 5. fig. 3. Bot. Mag.* 987. (*lanicula montana*; *Bauh. Pin.* 243. *Auricula urfi laciniata*; *Tourn. Inf.* 121.) "Calyxes shorter than the corolla." *Root* perennial. *Leaves* all from the root, heart-shaped, rounded, slightly cut into angular toothed lobes, green and rather shining above, pale underneath, on long villous petioles. *Scapus* from five to seven inches long, erect, simple, villous. *Flowers* reddish, violet or purple, sometimes white, sweet-scented; pedicels from six to ten, forming an umbel with an involucre of three oval wedge-shaped, toothed leaves. A native of Austria, Italy, and Siberia. It is a hardy plant, requiring a shady moist situation. 2. *C. Gmelini.* *Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Willd. 2. Gmel. fib. 4. 79. tab. 43. fig. 1.* "Calyxes longer than the corolla." *Root* perennial. *Leaves* small, between heart and kidney-shaped, obtuse, crenulate, a little villous, on long petioles. *Scapus* about four inches long. *Flowers* small, white; umbel of three or four rays; leaves of the involucre two or three, narrow, acute. *Capsule* nearly globular. A native of Siberia. *La Marck* observes that it is not well distinguished from *Androsace*; and *Gærtner* asserts that it truly belongs to that genus, and has nothing in common with *Cortusa* but the long petioles.

CORTUSA americana, flore squalide purpureo; *Herm.* See *Heuchera*.

CORTUSA americana, petalis integris; *Herm.* See *Farella cordifolia*.

CORTUSA americana, petalis fimbriatis; *Herm.* See *Mittella diphylla*.

CORTUSA arundinacea; *Plum*; See *Thalia geniculata*.

CORTUSA foliis ovatis sessilibus; *Hort. Cliff-Roy.* See *Vreascum myconi*.

CORTYTA, in *Ancient Geography*, a country of the Peloponnesus, in Laconia, according to Thucydides.

CORU, *arbuto vel malo aurea similis*. I. B. *Lufitanis herba Malabarica*, in *Botany*, is a dwarf-tree like the quince-tree, with leaves like it, and a yellow flower, having little or no smell; but Garcias makes it have leaves like those of the peach-tree, and a white flower smelling like the *periclymenum*. The bark of the root is of a watery green, light and thin, and if broken or wounded distills a copious milky juice; more rosy and viscid than what flows from the macer; insipid, if not a little bitterish, cold and drying, but more drying than cold.

The inhabitants of Malabar, both Pagans and Christians, make much use of the liquor of the green bark, though it be very ungrateful to the taste, on account of its surprising effects in all kinds of fluxes, as in the lientery, diarrhoea, and dysentery, from whatever cause they proceed. The dose is seven ounces in the morning, and as many in the evening, if necessity require it; but because the juice is bitter and unfavoury, they wash their mouths with whey after taking it. James.

CORVADO, in *Commerce*, a cloth measure in Persia, about an English yard.

CORVEES, Fr. services which vassals are bound to perform when called on by government or the superiors, of whom they hold their lands. The Canadians used to be obliged to perform several forts of corvées for government, such as the carrying of loaded batteaux up the river St. Laurence, &c.

The word *Corvée* seems to be derived from *cura via*, i. e. the care of the roads. In France it signified the call made on individuals to furnish labour and materials in kind for the construction and repair of roads. The same exists to this day in England under the name of "Statute-duty." With us it is under proper restrictions, but in France, where they had no turnpikes, all the roads, which are very good, were made and repaired by the corvée alone; whence it became an intolerable burden to the labourers. Under the administration of M. Turgot in 1774, their corvée for the high-ways was abolished, thus saving the nation 30 millions of livres annually. At present the roads are kept up by means of turnpike gates, the tolls of which are let every three years to the highest bidders approved by government. He also set aside another kind of corvée, which regulated the carriage of military stores and baggage. Detachments performing services without arms are also called *corvées*.

CORVET, or CURVET, from the Italian *corvetto* or *corbetto*, a crow, in the *Manege*. an air, resembling the hops of a crow, in which the horse's legs are raised higher than in the demi-volt; being a kind of leap up and a little forwards, wherein the horse raises both his fore-legs at once, equally advanced (when he is going straight forward, and not in a circle); and as his fore-legs are falling, he immediately raises his hind-legs, equally advanced; and not one before the other: so that all his four legs are in the air at once; and as he sets them down, he marks but twice with them.

Curvets are derived from and drawn out of the *Pefades*. They are lower before: the horse must advance, his haunches must follow closer, and beat or mark a quicker time: the haunches must be bent, his hocks be firm, and his two hinder feet advance equally at every time; and their action must be short and quick, just, and in exact measure and proportion. This action, when suited to the strength and disposition of the horse, is not only beautiful in itself, but even necessary to fix and place his head; because this *air* is, or ought to be, founded upon the true appuy of his mouth. It likewise lightens the fore-part; for as it cannot be per-

formed unless the horse collects his strength upon his haunches, it must consequently take the weight from the shoulders.

Horses that are very dull, or very fiery, are improper for curvets; this being the most difficult *air* they can make, and requiring a great deal of judgment in the rider, as well as patience in the horse, to perform it.

To succeed in this *air*, it is necessary that the horse should be perfectly obedient to the hand and heel; supple, and able to work upon one line or path, with freedom and ease; and likewise very well seated upon his haunches in his *terre-a-terre*. Curvets never succeed with horses which have bad feet, and which have any weakness or complaint in their hocks, whatever other powers and qualifications they may possess. Before a horse is put to make curvets, he ought to work *terre a-terre*; and if he cannot do this, he ought to be able to change hards upon *one* and *two* lines, to go off readily, and to make a good stop. After this, he should be able to make *pesades* easily, or so high before as to be felt and supported in the hand; and always make them upon a straight line. After this, let him perform two or three curvets; let him then go two or three steps, and then make two or three curvets, and so alternately. If you find that your horse is well in the hand, and that he advances regularly, is patient, and does not break his line, but keep even upon it, he will dress very easily, and soon; if he presses forward too much, make him curvet in the same place, and make him often go backward. After he has thus made two or three, demand three more of him, afterwards make him go backward, and so successively. As few horses, in making curvets, plant themselves well upon their haunches and hocks, and beat and mark equally and smartly the measure of the air, and keep their heads true, and croupe steady; the first lesson should be slow and gentle, the horse being made to rise very high before, because the longer time he is in the air, the more easy it will be for him to adjust himself upon his haunches, and to assure his head, and bend or gather up his fore legs; on the contrary, if he does not rise high before, he only beats and throws about the dust, and shuffles his legs, and can never assemble the different parts of his body, and be united, as he ought to be, in this manege.

This air is performed, in equal time and measure, by keeping the horse in, and with a good and just appuy; the rider keeping himself straight, and well stretched down in the saddle, and lifting his hand about three fingers breadth above the pommel of the saddle, with his body a little forward, and putting no stress on his legs.

It is not necessary that a horse should be absolutely perfect in curvets straight forward, before you put him to make them upon *voltes*; but as soon as he is grounded a little in curvets straight forward, it is right to begin to teach him the *time*, and the proportions of the *volte*. There are three actions, and three motions, still to be considered in making curvets. These are to raise him, or lift him up as it were by the action of the hand; to support him while he is in the air, or hinder him from bringing his fore-part too soon to the ground; and to make him go forward, while he is off the ground. To make a horse go in curvets side-ways, aid only with the hand, keeping his head to the wall. To the right, aid him chiefly with the outward rein, by turning your hand to the right; for then the left rein, or outward-rein, will be shortened, and operate upon the shoulders, so as to work them. Let him make these curvets side-ways; passage him afterwards always side-ways; then let him make the same number of curvets side-ways and obliquely again, and begin by little and little to diminish his passage, and

augment

augment the curvets, till he is able to furnish, without intervals, an entire volte upon two lines. Curvets made backward are more fatiguing, and more apt to make a horse rebel, than curvets straight forward upon the voltes, demi voltes, or side-ways. To teach him, make him go backward; afterwards put him to make three or four curvets in the same place, without advancing. Then make him go backward again; let him make the same number again, and so successively, till he makes them readily and without resistance. To go backwards in curvets, aid with the outward-rein; you will thus confine the fore-part, and widen the hinder legs, which ought to be at liberty, because it is with them that he leads. You must keep your hand low, that the horse may not go too high. Let your body be a little forward, to give the greater liberty to the hinder legs, which are those that lead, and do not aid with your legs, unless he drags his haunches. If the horse does not unite of his own accord, you must catch the time with your bridle-hand, as the horse is coming to the ground; in that instant put your hand towards your body, and so pull him back. In making curvets upon the voltes, let only your outward hip and outward haunch be a little advanced, and remember to loosen always and relax the inside of your hams, or your legs from the knees. When you would change to the left, let your hand accompany and correspond with your right leg, which is to operate; when you would change to the right, let it answer to your left leg:—having given this aid, replace yourself, stretch yourself down again in your saddle, take away your legs, one or the other, forbear to aid, and let the balance of the body be no more than just in the inside. Having acquired the art of working a horse in curvets straight forwards, backwards, side-ways, to the right and left, you will easily teach your horse to make the figure of a *cross*, or even dance the *saraband* in this air. See Bereuger's Art of Horsemanship, vol. ii. p. 117, &c.

Some derive the term from the Spanish *corva*, signifying the *hock* at the hinder leg, because the horse bends his hocks, and throws his weight upon them, in executing this manege. This air was called by the older Italian masters *ur-sata*, or the gambols of a bear, from *ursa*, a bear; as the horse, in making curvets, was thought to resemble the motions of a bear, when he dances upon his hinder feet.

CORVEY, or CORWEY, in *Geography*, a town and celebrated abbey of Germany, and small principality in the circle of Westphalia, about 12 miles long and 10 wide, situated on the western bank of the Weser. The abbey was founded in the year 822; its annual revenues are about 30,000 or 40,000 florins; 24 miles E. of Paderborn. N. lat. 51° 39'. E. long. 8° 54'. By the treaty of indemnities in 1803, the bishopric of Corwey, and also that of Fulda, together with the imperial town of Dortmund, and several abbeys, were assigned to the prince of Orange, as the indemnity for the office of stadtholder, and his domains in Holland.

CORVINI, in *Ichthyology*. See GUATUCUSA.

CORVINARII. These anciently were soldiers who fought on large chariots armed with scythes on their sides.

CORVINI, MATTHEW, in *Biography*, king of Hungary and Bohemia, lived in the 15th century, and died in the year 1490. He was both a lover and guardian of literature. He purchased innumerable volumes of Greek and Hebrew writers at Constantinople, and other Grecian cities, when they were sacked by the Turks; and as the operations of typography were then imperfect, he employed at Florence many learned librarians to multiply copies of classics, both Greek and Latin, which he could not procure in

Greece. These, to the number of 50,000, he placed in a tower, which he had erected in the metropolis of Buda; and in this library he established 30 amanuenses, skilled in painting, illuminating, and writing: who, under the conduct of Felix Ragulinas, a Dalmatian, consummately learned in the Greek, Chaldaic, and Arabic languages, and an elegant designer and painter of ornaments on vellum, attended incessantly to the business of transcription and decoration. The librarian was Bartholomew Fontius, a learned Florentine, the writer of many philosophical works, and a professor of Greek and oratory at Florence. When Buda was taken by the Turks, in the year 1526, cardinal Bozmanni offered for the redemption of this inestimable collection 200,000 pieces of the Imperial money, but without effect; for the barbarous besiegers defaced or destroyed most of the books, in the violence of seizing the splendid covers, and the silver bosses and clasps with which they were enriched. Wharton's Hist. of English Poetry, vol. ii. p. 417.

CORVINDUM NELLA. See NELLA *Corvindum*.

CORVINUS, JOHN AUGUSTUS, in *Biography*, an engraver, born at Leipzig in 1682. He went to reside at Augsburg, where he engraved plates for several considerable works published in that city; but his style, though neat, is stiff and without taste. He died at Augsburg in 1738.

Amongst his engravings are several of the plates for a work called, "Representatio Belli ob Successionem in Regno Hispanico;" most of those for "the Bible of Scheuchtzter;" and a collection of views of churches in Vienna. Strutt. Heineken.

CORVINUS *Lapis*, in *Natural History*, a name given by some to the *belemnites*; but by others to a very different body of a whitish colour, and oval figure, convex on one side, and concave on the other, and in the middle of the concave side there arises a tubercle: this is said to be taken out of the head of a fish; and it is very possible that the authors may mean by this no other than our crab's eyes.

CORVIPETA AVIS, in *Ornithology*. See GUIT-GUIT.

CORULA, in *Ancient Geography*, an ancient town of India, on this side of the Ganges. Ptolemy.

CORUNCALA, a town of India, on this side of the Ganges. Ptolemy.

CORUNDUM. See ADAMANTINE Spar.

CORUNNA, in *Geography*, a sea-port town of Spain, in the province of Galicia; of which it is deemed the capital, being the seat of a royal audience, of a governor-general, and the intendant of the province. It is divided into the Upper and Lower Town; the former situated on the side of a hill, surrounded with walls, and defended by a castle; the latter, called also "Pexaria," is seated at the bottom of a hill, on a tongue of land, washed on three sides by the waters of the Atlantic. The town is of a circular form, fortified in the ancient manner, and contains one collegiate and four parish churches, and four convents. The harbour, called by our mariners the "Groyn," is large and safe, and defended by two castles; 60 miles N. of Orense. N. lat. 43° 23'. W. long. 8° 17'.

CORVO, one of the African islands, usually included under the general appellation of the Azores, though but improperly, as this small island, as well as Flores, lying about a league to the N. of it, is distant 70 leagues W. of Terceira. This island is about 30 leagues in circuit, has a small port, and contains about 500 inhabitants. It is said to have derived its name from the vast number of crows observed here by its first discoverers, every tree and rock being covered with their nests. Its productions are the same with those of Flores. The Portuguese are said to keep possession

of these islands, not on account of their intrinsic importance, but in order to prevent other nations from establishing themselves here, and thus endangering the security of the Azores. N. lat. 39° 42'. W. long. 31° 6'.

CORVORANT, in *Ornithology*, *Corvus Aquaticus*. See **PELECANUS Carbo**.

CORVORANT, *red-faced*, of the Arctic Zoology. See **PELECANUS Uric**.

CORVORUM ANTRUM, in *Ancient Geography*, a mountain of Asia, in Cilicia.

CORUS, or **CORYS**, a large river of Arabia, which discharged itself into the Red Sea. Herod. l. iii. 9.

CORUS. See **KUR**.

CORUS, **OMER**, **HOMER**, or **CHOMER**, in the *Jewish Antiquities*, a measure containing ten baths, or seventy-five gallons, and five pints, as a measure of things liquid, and thirty-two pecks and one pint, as a measure for things dry. The *corus*, or *omer*, was most commonly a measure for things dry, and the greatest that was used among the Jews. It contained, according to the rabbins, ten ephas, or thirty fata or feahs. *Corus* is the most usual term in the historical writers, and *omer* or *chomer* among the prophets.

CORUS is also used in some of our old writers for eight bushels, or a quarter; *decem coros tritici, sive decem quarteria*.

CORUSCATION, (from the Latin *coruscare*, to sparkle, to dazzle,) denotes a transient or interrupted gleam of light issuing from any particular object; a sparkling or glittering. Partial flashes of lightning, such as appear in any particular part of the sky, without illuminating the whole visible hemisphere, the flashing of the *aurora borealis*, or northern lights, and the sudden lights of meteors, have been mostly denominated coruscations. The same appellation has likewise been applied to the flashings arising from certain chemical compounds, from phosphorescent substances, from artificial electricity, from bright metallic armour, when exposed to the light of the sun or a fire; and, in short, to every thing which may affect our sight with a sudden bright light.

Of the nature of the coruscations which arise from lightning, from meteors, and from the *aurora borealis*, a particular account will be found under those articles. The coruscations which are produced from chemical preparations, from decompositions, and from artificial electricity, are described under the articles **INFLAMMATIONS**, **PHOSPHORIC SUBSTANCES**, and **ELECTRIC light**. We shall, however, in this place briefly describe the preparation and the effects of a few by way of specimens, and for the immediate satisfaction of the reader. As for the glittering of bright armour, swords, and the like, it is nothing more than a reflection of light which catches the eye at intervals; and it needs no farther illustration.

The easiest experiment of the kind may be performed with any highly inflammable powder; but the most convenient are the powder or seeds of lycopodium, and the powder of rosin. A small quantity (about a dram) of either of those powders, held in a spoon, or in an open piece of paper, is thrown against the flame of a candle, or of a burning piece of paper, and a sudden flash will ensue; for the powder being very light, will, on being thrown, disperse itself through the air; and, being highly inflammable, the fire will be instantly communicated from one particle to the next, and the whole will be consumed. In this manner the imitations of lightning, and of other extraordinary fires, are performed at the theatres. Though the powder of lycopodium, and powdered rosin are equally fit for this purpose; yet the former is prefer-

able to the latter, on account of its being a dry powder or a substance of no adhesive quality; whereas powdered rosin sticks to the hands and to any thing on which it may fall; nor is it easily brushed off.

A very entertaining sort of coruscations is obtained by the use of phosphorized lime. When a small quantity (about 20 or 30 grains) of this preparation is thrown into a glass of water, bubbles of gas are successively extricated from it, which, rising to the surface of the water, are inflamed on coming in contact with the air of the atmosphere, producing a flash of bright light. And as a succession of such bubbles is produced during a considerable time, a repetition of such flashes will sometimes continue for a quarter of an hour and upwards. In this experiment the gas, which is extricated from the preparation, is a phosphorized hydrogen; and it is a property of this kind of gas to take fire the moment it comes in contact with the common, or respirable, air. As this gas has a very disagreeable smell, in performing the above described experiment, it will be proper to place the glass either under a chimney, or on the outside of a window, close to the fast.

An electrical experiment commonly known by the name of the *aurora borealis*, is peculiarly fit for shewing coruscations. The apparatus consists of a glass phial, in great measure exhausted of air, and furnished with a brass knob. By applying the hands to the outside, and presenting the brass knob to the prime conductor of an electrical machine, this phial is charged; and in that state it is either suspended by a string, or simply laid upon a table, in a darkened room, where flashes of light will be seen at intervals within the glass, and these will continue to appear for a very considerable time. It is from the similarity of these flashes to the northern lights, that this phial has been called the *aurora borealis*. The effect is owing to the partial discharges of electricity from the surface of the glass.

A similar effect may be produced by rubbing a piece of thick brown paper in a dark room; for the paper, thus excited, will dart flashes of electric light to the fingers, to a key, or to any other conductor of electricity, that may be presented to it. But, in order to succeed, the paper must be thoroughly dry and warm, on which account the experiment can hardly ever be performed at a distance from the fire. However, if the fire in the chimney is not very bright, and the operator turns his back to it, the flashes on the paper will be seen sufficiently clear.

CORUSCATULA, in *Natural History*, a name given by Mr. Lhuyd to a species of fossil plant of the fern kind, which that gentleman happened to find covered with a shining or glossy coat.

CORUSIA, in *Ancient Geography*, a town of Asiatic Sarmatia, situated, according to Ptolemy, near the river Vardanus.

CORVUS, in *Antiquity*, a machine invented by an engineer in the Roman fleet at the time of their wars in Sicily, when they first engaged the Carthaginian fleet. For a description of this machine, see Polybius, lib. i. p. 22. ed. Casaub. See the article **CORBEAU**. By means of this new engine the Romans got a victory over the Carthaginians in their first sea-fight with them, though the enemy were long before well skilled in naval affairs, and the Romans raw and ignorant.

The Carthaginians, considering the Roman machines, or corvi, as idle inventions of persons not acquainted with the sea, rowed up with confidence to the Roman galleys, and began the battle. The Romans, however, grappling with them by means of their corvi, and boarding their ships with great ease, fought hand to hand with them as upon

firm

CORVUS.

firm ground. Being more expert at this kind of fight than the Carthaginians, and better armed, they soon gained the advantage over them and took 30 ships, with all their crews. Among these was the admiral's own galley, a septemremis, which had been formerly taken by the Carthaginians from king Pyrrhus. Hannibal himself was on board of it; but when he saw the Romans entering his galley he leaped into a small boat, and escaped. At length the rest of the Carthaginian fleet, consisting of 120 galleys, came up, and fell upon the Romans. As they had greatly the advantage in the lightness of their vessels, they nimbly rowed round the Roman galleys, in order to avoid the corvi. But the Romans having learned the art of working their ships, so as to prevent their machines to the enemy, which way soever they approached them, took 50 more of the Carthaginian ships, and obliged the rest to retire into the neighbouring ports of Sicily. In two engagements the Romans took 7000 prisoners, killed 7000 men, sunk 13 ships, and took 80. After this victory, Duilius, the Roman consul, going ashore, put himself at the head of the land-forces, relieved Segesta, which was besieged by Hamilcar, and made himself master of Macella, though defended by a numerous garrison. Polybius, *ubi supra*.

CORVUS, *Raven*, in *Astronomy*, a constellation of the southern hemisphere; whole stars in Ptolemy's Catalogue are 7; in Tycho's as many; in the Britannic Catalogue 9. See **CONSTELLATION**. For the lustre of the stars in corvus, see Dr. Herschel's second catalogue in *Phil. Transf.* for 1795, pt. ii. vol. lxxxvi. p. 468, &c.

CORVUS, in *Ichthyology*, a name given by Paulus Jovius to the *faber*, or doree. See **ZEUS faber**.

CORVUS is also the name given by Pliny and Salvian to the *tub-fish*, or *TRIGLA Hirundo*; which see.

CORVUS piscis, the *crow-fish*, a river fish of the *chub* kind, common in Italy, and in some parts of Germany, and called by Gesner, *capito fluvialis rapax*, and by the common people *rappe*. This is the **CYPRINUS Aspius** of Gmelin; which see. It seldom grows to more than six or seven (Gmelin says 12) pounds weight; it is an extremely rapacious fish, not less so than the pike, and very frequently chases its prey so hard as to drive them out upon the bank, and, in that case, he usually follows them also, and both are frequently taken, stranded together. It is caught at all seasons of the year, but never in any great abundance; it is esteemed a very delicate fish.

CORVUS, in *Ornithology*, a numerous and interesting genus of the *Pica* order. These are the crows of English authors.

Birds of this kind have the bill convex and acute at the edges; the nostrils covered with setaceous recumbent feathers; tongue cartilaginous and bifid; feet formed for walking.

Most of the species in this genus are found widely dispersed over every part of the globe. They build in trees and lay about six eggs. Crows are of a social nature, very clamorous, and promiscuous feeds, subsisting both on animal and vegetable food. Many birds of this tribe inhabit Britain.

Species.

CORAX. Black; back blueish-black; tail roundish. Linn. Faun. Groenl. *Corvus*, Gesner, &c. *Corvus maximus*, Scop. *Corbeau*, Buff. *Il corvo reale*, Cetti. *Rabe* Frisch. *Raven*, Alb. &c.

From its superior magnitude the raven is considered as the first species of the *corvus* genus; this weighing about

three pounds, and in length measuring two feet, its breadth four. The general colour of its plumage is black richly glossed above with blue, and the under parts more obscure. The raven inhabits Europe, Siberia, and North America, feeding on carrion, small birds, eggs, fish, berries, &c. It is esteemed a crafty bird, and of a thievish noisy disposition; it may be in a great measure domesticated and taught to articulate. In this country it builds in high trees, but is observed to form its nest in cavities of the rocks in Greenland and Iceland. It is the only kind of crow found in Greenland, where the flesh is eaten by the natives and the skin employed as a covering next their bodies. The principal varieties of this bird are the *Cacalot* of Fernand; found in New Spain, and is of the pied kind, being varied with white; the white raven of Norway, *Corvus albus* of Schwenck; and *Corvus borealis albus* of Brisson. Neither of these can be considered as a permanent but as accidental varieties; ravens and other birds both of the pied sort, and perfectly white having been occasionally reared from the same brood with those of the ordinary kinds.

HOTTENTOTTUS. Greenish-black; tail even; whiskers very large. Linn. *Monedula capitis bonæ spei*, Briss. *Choucas mouflacbe*, Buff. *Hottentot crow*.

Size of a black bird; length seven inches and a quarter; the bill an inch and a half long, of a black colour and bent a little; the feathers about the nostrils velvety, the corners of the mouth beset with short stiff bristles, and the nostrils furnished with whiskers three inches long. The feathers on the head, throat, and neck are of a shining black green; those on the upper part of the neck narrow and longer than the rest, flowing over the back; the other parts of the plumage greenish-black changeable to blue; legs and claws black. This inhabits the Cape of Good Hope.

CLERICUS. Black; chin white, base of the bill cinereous. Sparman Mus.

Inhabits Sweden according to the above-mentioned writer, and is extremely rare; the colour of the body is sooty black above; the wings and tail inclining to dark olive. This is perhaps only a variety of the carrion crow.

CORONE. Entirely black, with a violet blue gloss; tail rounded, feathers pointed at the ends. Linn. *Cornix*, Ray, &c. *Corneille*, Buff. *Carrion crow*.

A species found in Europe, Siberia, North America, New Guinea, New Holland, and some other parts of the world. The length of this bird is eighteen inches, its form and manners much resembling those of the raven. Like that bird it builds its nest on high trees, and lays about six eggs; it also delights in carrion and animal food like the raven, and makes great havoc among young game of all kinds. This bird, though so common in England, is said to be very sparingly met with throughout the northern parts of Europe.

A variety of this crow is described by Brunnich, which has the cheeks, fore part of the neck, middle of the belly, rump, and quills white, and the rest of the plumage black. This is found in the Ferroe isles. Schwenckfield mentions another kind which was wholly white, except the legs and bill; the colour was not pure white, and the irides were red.

NOVÆ HOLLANDIÆ. Black, quill feathers brownish black; feathers on the chin loose. *Corvus australis*, Gmel. *Southern raven*.

A native of the Friendly islands and New Holland. The length is nineteen inches; the bill strong at the base, and much compressed at the sides; the plumage dusky black; the

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the feathers beneath the chin of a remarkably loose texture; tail eight inches long, and the legs and claws black.

ALBICOLLIS. Blackish; wing-coverts brown; a broad femular white patch on the neck; bill carinated. Lath. &c. White necked South sea raven.

This bird was first described by Dr. Latham, in the supplement to his Synopsis, from a specimen in the British Museum. The bill in this is ridged and arched on the top of the upper mandible, like that of the ani, but is not sharp at the edge. The general colour of the plumage is black, but the whole of the hind part of the neck in this specimen is white, and advances in a somewhat crescent form on the fore part; the bill is thicker, the legs more scaly and rough, and the claws larger than in the former bird; but whether it ought not rather to be regarded as the adult state of that bird, than as a distinct species, seems uncertain. It is supposed to have been brought from Africa.

FRUGILEGUS. Black; front sub-cinereous; tail roundish. Linn. Fn. Suec. *Cornix frugilega*, Aldr. Briss. &c. *Frenx* or *frayonne*. Buff. Rook.

The rook inhabits most parts of Europe, and extends as far as western Siberia. It is rather larger than the crow, but so nearly resembles that bird in other particulars as to be scarcely distinguished from it, except in having the skin about the nostrils and base of the bill bare, while in the crow those parts are well clothed with feathers and bristly hairs. This is not a natural character, but arises from the habits of the bird, who is continually thrusting the bill into the earth in quest of worms, and the larvæ of insects, for it does not subsist on carrion like the other. The rook feeds on grain, and sometimes trespasses on cultivated grounds, to the injury of the husbandman; but his good services considerably overbalance these little depredations, in the extirpation of the maggots of the chafer-bettle (*cetonia melolonthæ*), which, feeding at the roots of the corn, would oftentimes destroy whole crops, were they not destroyed by these useful birds.

This is a gregarious bird, and is sometimes seen in immense flocks, so numerous indeed as to almost darken the air in their flights, which they regularly perform morning and evening, except in the breeding time, when the daily attendance of both male and female is requisite to the purposes of incubation, or feeding their young. They build in the highest trees, beginning to form their nests in March, and forsaking their breeding places when the young are reared. The young rooks are esteemed good eating.

CORNIX. Dark-ash; head, throat, wings, and tail black, Linn. *Cornix cinerea*, Briss. *Cornix cinerea frugilega*, Gess. *Cornille mantelée*, Buff. Royston crow. Albin, &c. Hooded crow.

Inhabits Europe, part of Asia, and America likewise, if the crow mentioned by Kalm as being found in Pennsylvania is of this species. This bird is about the size of the rook, or rather larger; and twenty two inches in length. The plumage as above described; with the bill and legs black, and the irides hazel. Its manners coincide in some degree with those of the rook, and the crow; like the latter feeding at times on carrion, young birds, and other defenceless animals; or at other times, like the rook, being content with insects, seeds, and berries. They are also gregarious, and build in trees. It is found in the southern parts of Britain only in the winter, but remains in Scotland throughout the year, and is the only kind of crow that inhabits the Scottish highlands.

DAURICUS. Black; crown blueish black; neck, throat, and belly white, Pallas. *C. dauricus*, Lath. *Cornille du Se-*

negal, Buff. Chinese black raven, with white neck. Ofbeck. White-breasted crow. Lath. Syn.

This bird is the size of a small crow, and rather exceeding the length of twelve inches. The bill is black; the head and throat black, glossed with blue, as is also the rest of the plumage, except the neck and breast, which are white. It inhabits Africa and Asia. Pallas says it comes early in the spring in great flights from China, and the southern Mongul country, into the parts about the lake Baikal, but they are most frequent about the towns and villages on the river Lena. This writer mentions a variety of these, the plumage of which is black, with the nape of the neck and throat brown.

CALEDONICUS. Cinereous; bill, eye-brows, tail, and legs, black, Gmel. New Caledonian crow. Lath.

The description of this bird is taken from a drawing in the collection of Sir Joseph Banks. The length is above fifteen inches; bill stout, and of a black colour; irides pale yellow; eye-lids black. General colour of the plumage cinereous, except the tail, which is five inches in length, and of a black colour; legs black. Inhabits New Caledonia.

JAMAICENSIS. Entirely black. Gmel. *Cornix Jamaicensis*, Buff. *Cornille de la Jamaïque*, Buff. Chattering crow, or cacao walk. Ray.

Size of a crow, with the bill and legs like the plumage, black. This bird is common in Jamaica, where it frequents the mountainous parts of the island. It makes a chattering noise, different from any of the European crows, and is esteemed by some good eating. Its food consists of berries and insects.

MONEDULA. Black-brown; hind-head hoary; front, wings, and tail, black. Linn. *Graculus or monedula*, Gess. *Monedula*, or *leous*, Aldr. *Cornix garrula*, Klein. *Doble*, Gunth. *Taccob*, Cetti. *Mulacchio nera*, Zinac. *Le choucas*, Buff. Jackdaw.

This bird, though abundant in Britain, is far from common throughout Europe; with us they remain the whole year; but are migratory in most other parts. They seldom build their nests in trees like the rook, more commonly in rocks, old towers, and ruined edifices; and lay from five to six eggs, which are paler, smaller, and have fewer spots than those of the crows.

There are many varieties of this bird, some of which it may be proper to notice. The Helvetian daw of Charlton, *le choucas à collier* of Brisson, differs in having a collar of white round the neck; this is the collared jackdaw of Latham, and is found in Switzerland. The white jackdaw is entirely of a white colour, with the bill yellowish; *monedula candida* of Schwenck., and *le choucas blanc* of Brisson. The black jackdaw of English writers is *le choucas noir* of Buffon and Schwarze *doble* of Frisch. This kind differs from the common jackdaw in wanting the greyish tinge about the head, in being of a smaller size, and having many white spots about the eyes. Dr. Latham mentions one formerly in the Leverian Museum, which was "like the common ones in all things, except the mandibles, both of which crossed each other, as in the cross-bill." This is at present in the London Museum.

GLANDARIUS. Wing-coverts blue, with transverse black and white lines; body ferruginous, inclining to vinaceous, Buff. *Corvus glandarius*, Linn. *Garrulus*, Briss. *Pica glandaria*, Gess. *Gbiandaja*, Olina. *Jeay*, Buff. Jay.

The jay is a beautiful species, and measures about thirteen inches in length; it is common in our woods, and is well known to be a restless noisy bird. They build in woods, making the nest of sticks, fibres of plant roots, and tender twigs; and lay five or six eggs, of the size of a pigeon's, the colour

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colour of which is cinereous-olive, marked with pale brown. The young remain with the old ones till the next pairing-time, in spring, when each makes choice of a mate. In general they feed on acorns, nuts, seeds, and fruits of all kinds, and oftentimes destroy young chickens, or their eggs, small birds, &c. The species is only partially dispersed throughout Europe.

Briffon describes a variety of this bird, *le geay blanc*, and Dr. Latham mentions another of the same kind, his white jay. "This (says the last mentioned writer) is wholly white, the bill and eyes not excepted; and the iris red. I have such an one in my collection, which was found in the nest with four others of the common colour." The bird as described is in the London Museum at this time.

ARGYROPHthalmus. Black; breast blue; eyes silvery; tail white at the tip; bill and legs black. Jacquin. Surinam daw. Brown. Surinam crow. Lath.

This is the size of the common crow, and inhabits the woods of South America. The specimen described by Dr. Latham, in the collection of Mr. Tunstall, had lost its tail. The two Gmelinian species of *corvus*, *argyrophthalmus* and *surinamensis*, are to be considered as the same.

CRISTATUS. Blue; collar black; wing-coverts with transverse black lines, Gmel. &c. *Corvus cristatus*, Linn. *Garrulus canadensis cæruleus*, Briff. *Pica glandaria cristata*, Klein. *Le geay bleu de Canada*, Buff. *Haubenhaber*, Borsowk. Blue or crested jay.

This bird is much smaller than our jay; the length eleven inches. The bill is black, and an inch in length. The head is crested and blue; at the base of the bill black. A streak of black passes on each side through the eyes, below the crest, and behind it, and thence tending forward, unite, and form a crescent on the breast. The sides of the head and throat are blueish-white, and a spot of the same appears over each eye. The hind part of the neck and back are blue, as are also the wings and tail; the feathers of the latter, except the two middle ones, white at the tip, and the whole, together with the wings, elegantly barred with black. The breast is blossom-colour; legs dusky-brown; with the tail nearly as long as the rest of the bird. The blue jay inhabits North America, especially in New York and New England, where it is very common. It builds in swamps, and has a soft delicate note. It feeds on nuts, which, like the nutcracker, it breaks by placing between the feet, and pecking with the bill. Maize is a favourite food, and being a gregarious species, the blue jays often unite into flocks of twenty or thirty thousand, which, alighting upon a plantation of a few acres, oftentimes lay waste the whole; and it is hence considered the most destructive bird of America.

STELLERI. Body above black; beneath and wings blue; tail cuneated and blue; head crested. Gmel. Steller's crow. Lath.

The length of this bird is fifteen inches. The bill is an inch and a half long, and of a black colour; with five or six black bristles just at the gape. The head is crested; the crest above two inches in length, and composed of narrow brown feathers; the general colour of the rest of the plumage purplish-black, inclining to green on the rump. Half of the wing-coverts is of a brownish-black, the others of a deep blue. The second quills are also blue, crossed with eight or nine bars of black, in the same manner as the blue jay; the greater quills are black with the outer edges blue-green; the fore part of the neck and breast dusky; belly and vent pale blue; legs black. The specimen described came from Nootka Sound, where it was met with by our late circumnavigator, captain Cook, and is in the

collection of Sir Joseph Banks, bart. The bird was noticed before by Steller, and hence obtained the name *stelleri*.

CAYANUS. Somewhat violaceous, beneath white; throat and front black; tail white at the tip, Gmel. *Garrulus cayenensis*, Briff. *Geay de Cayenne*, Buff. *Blanche coiffée*, Buff. Cayenne Jay.

About the size of our common jay. The bill an inch and a quarter long, and of a grey colour; the feathers which surround it, together with the forehead, cheeks, throat, and lower part of the neck, black. On each side of the head are three white spots; the first above the eye, the next beneath it, and the third at the base of the lower mandible. The back and wings are violet, tinged with ash-colour. The tail violet, with the edges brown, and white tips, except the two middle ones, which are violet brown; legs and claws grey. Inhabits Cayenne.

AURITUS. Somewhat crested, and cinereous-brown; frontlet of the head and chin black; spot in front and at the ears white; quill feathers black, edged with grey. Lath. *Petit geay de la Chine*, Sonnerat. White-eared jay.

Described from Sonnerat as a native of China, where it is said to be common about Canton, and seen in flocks in Dean's island, Wampoo river, picking up food on the mud of the shore. It is the size of the blue jay; the bill black, with the ridge of the upper mandible sharp; the top of the head crested, and of a blueish-ash colour; tail four inches long, of a somewhat rounded form, and curving a little downwards; legs pale brown, with the hind claw large, and much incurvated.

PURPURASCENS. Reddish, beneath pale yellow; head purplish; quill and tail-feathers black. Lath. Purple-headed crow.

The present species is described by Dr. Latham, on the authority of a drawing in the collection of the late Dr. Fothergill. The bill is lead-coloured; the nostrils covered with reflected feathers; tail rather long, and legs flesh-colour. Supposed to be a native of China.

MACENSIS. Greyish-ash; back, wing-coverts, and vent red; forehead, quill feathers, and tail black; secondary quill-feathers bimaclated with white. *Corvus sinensis*, Lath. *Corvus macensis*, Gmel. *Pie de Macao*, Sonnerat. Macao crow, or Chinese jay.

Inhabits China, especially the island of Macao. Its size is one-third less than the common magpie. The bill and forehead black; irides yellowish; top of the head cinereous grey, neck and breast dirty grey; belly and thighs the same, but paler; rump cinereous grey; second quills greenish-black; legs black.

RUFUS. Reddish, beneath reddish-white; head and neck fuscous; wing-coverts and second quills grey; lateral tail-feathers grey, the extreme half brown, with the tips white. *Corvus rufus*, Lath. *Pie rousse de la Chine*, Sonnerat. Rufous crow.

This is the size of a black-bird, and has a black bill, the irides rufous yellow; breast and belly rufous white; back and rump yellowish, inclining to rufous; lesser wing-coverts dirty rufous; tail cuneated and the two middle feathers brown at the ends; legs black. A native of China.

CARYOCATACTES. Brown dotted with white; wings and tail black; tail-feathers white at the tips, with the middle ones broken at the ends. Linn. *Corvus cinereus, cauda alisquæ nigris*. Fu. Suec. *Caryocatactes*, Gessn. Ray &c. *Merula saxatilis*. Aldr. *Nucifraga*, Briff. *Tannen-Heber*, Frisch. *Waldstark*, *Steinheber*, Kram. *Nußkräcker*, Schranck. *Casse noix*, Buff. Nutcracker.

Found in various parts of Europe, but are most common, in

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in Germany. Its size is that of a magpie, the bill nearly straight, about two inches in length, and of a black colour; irides hazel; legs black. In its manners of life it resembles the jay, but is said to frequently pierce the trees like the woodpecker; the principal food of this bird is acorns, nuts, and the seeds of pines, or berries and insects.

BALICASSIUS. Black-green; tail furcated. Gmel. *Corvus splendide nigro-viridans*, Briff. *Choucas des Philippines*, Buff. Philippine crow.

This is the size of a black-bird; the plumage black, glossed with green; tail nearly four inches long, and much forked; the legs and claws black. The species inhabits the Philippine isles where it is called Bali Cassio, and is reputed a good songster.

NOVÆ GUINEÆ. Front, frontlet, and tail black; head, neck, back, and upper part of the breast dusky-ash; lower part, belly, vent, and rump white, transversely streaked with black. Gmel. *Choucas de la nouvelle Guinée*, Buff. New Guinea crow.

Inhabits New Guinea. Its size is that of a jackdaw, the bill strong and blackish, the forehead and round the bill black passing in a streak through the eyes, and a little behind them. The head, neck, back, and upper parts of the breast dark ash-colour; wings dusky, edged with white; tail black; legs short and dusky. A variety of this bird is described in Dr. Latham's Ind. Orn. which is of a cinereous colour, with the head and neck blueish; frontlet and band through the eyes black; breast and belly pale rusty; and the legs fuscous red and wrinkled.

PAPUENSIS. Cinereous, abdomen white; wings blackish-brown. Gmel. *Choucas de la nouvelle Guinée*, Buff. Papuan crow. Lath.

The length of this bird is eleven inches, the bill yellowish, back of the upper mandible angular; legs small and cinereous, claws short. This kind inhabits New Guinea.

NUNUS. Black; feathers on the cap downy; neck generally bare. Gmel. *Coliad de Cayenne*, Buff. Bare-necked crow. Lath.

A native of Cayenne. This is about the size of the *Momodula*; the bill is broad at the base, and of a dirty ash-colour; legs yellowish; tail even.

CALVUS. Ferruginous brown; front and crown bald. Gmel. *Choucas chauve*, Buff. Bald crow.

The great singularity of this bird consists in the fore part of the head as far as the crown, and beyond the eyes, being bare of feathers, and the chin sparingly covered: the bill is black and the legs dusky. A native of Cayenne.

PACIFICUS. Cinereous, inclining beneath to bay colour; hind head, neck, wings, and tail black, the two last tipped with white. Gmel. Pacific crow.

Length ten inches and a half, the bill straight, somewhat bent at the end, and notched near the tip; legs and claws black. Inhabits the South Sea islands.

TROPICUS. Black; vent dotted with dirty white; tail rounded. Gmel. Tropic crow.

The length of this bird is twelve inches and a half; the bill an inch and a quarter long, at the base rather broad, and the tips of both mandibles notched; the plumage of a glossy, black above, beneath more obscure; wings and tail black glossed with green, the latter rounded; vent and feathers at the side tipped with whitish; legs and claws black. Described from a bird in the possession of sir Joseph Banks, brought from O-why-hee, one of the Sandwich islands.

ERYTHORHYNCHOS. Body above fuscous, beneath whitish; tail cuneated; quill-feathers at the base pale vio-

let, in the middle black with the tips white. Gmel. Red-billed jay.

Rather larger than the common jay. The bill is red (whence its name); the fore part of the head, neck, and breast velvet black; hind part of the head and neck light grey, irregularly variegated with black on the fore part of the head. The body is tinged throughout with violet, which is most conspicuous on the wings. All the feathers consist of three colours, being of a light violet at the base, black in the middle, and white at the end; the legs are red, with the claws long, whitish, and hooked, and the point black.

SIBENSIS. Above tawny-red, crown brown; eye-brows white; tail brown and cuneated, with a black band towards the tip; and dirty white roundish spots near the end. Gmel. Chinese jay.

The description of this beautiful bird is taken from a drawing of Chinese birds in the collection of the late Dr. Fothergill.

SIBERICUS. Above cinereous; beneath rusty-orange; quill and two middle tail-feathers cinereous, the rest orange. Gmel. *Geay de Siberie*, Buff. Siberian jay.

Inhabits Siberia, and measures in length about ten inches. The bill is dusky; front, cheeks, chin, and throat pale; crown somewhat crested, and brownish-black; rump rusty-orange; legs cinereous. The manners of this bird are unknown.

PERUVIANUS. Above pale green; beneath pale yellow; crown white; a black narrow band down the chin and throat; the three exterior tail-feathers on each side yellow. Gmel. *Geay du Perou*, Buff. Peruvian jay.

Buffon describes this bird, but on what authority does not appear; it is said to be a beautiful species, and a native of Peru.

FLAVUS. Above greenish-brown, beneath yellow; chin and eye-brows white; wings and tail reddish-brown. Gmel. *Garlu ou Geay à ventre jaune de Cayenne*, Buff. Yellow-bellied jay.

The length of this species is nine inches. The bill like that of the common jay, stout, and of a dusky colour; along the middle of the crown is a longitudinal golden streak; the legs are slender, straight, and of a horn colour.

SENEGALENSIS. Violet-black, tail cuneated; limbs black. Gmel. *Pica senegalensis*, Briff. *Pie du Senegal*, Buff. African crow.

Inhabits Africa, about Senegal. The length is fourteen inches. Body beneath dirty black; bill black; quill and tail-feathers brown, edged with violet black. The Gmelinian *corvus aser* is imagined to be a variety of this species.

CYANEUS. Cinereous; crown deep shining black; wings and tail blue; tail feathers very long, the middle ones tipped with white. Pallas. Blue crow.

About nine inches in length, and inhabits Dauria. The species is gregarious, timid, cunning, and noisy, and builds among shrubs and willows.

PICA. Black and white variegated; tail cuneated. Linn. *Pica*, Nozeman. *Pica varia*, Gefn. Magpie.

There are several varieties of this species, one of which has the body longitudinally streaked with black and white, and another the plumage white altogether. The magpie is a native of Europe, North America, and Asia.

The magpie appears to be every where common in Britain; it is found as far to the south as Italy, and to the north to Sweden and Denmark. Forster met with it at Madeira, and it is also seen in America but not commonly. At Hudson's

Hudson's bay it is called Oue-ta-kee-aske. In manners this bird approaches the crow, feeding indiscriminately on animal and vegetable food; and is very destructive to gardens and orchards. It is a crafty, restless, clamorous bird, and if domesticated when young may be taught to imitate the human voice; but its articulation is more defective than that of the parrot. The magpie builds its nest with art, forming a thorny covering at top, and leaving a hole on the side for admittance; the eggs, about six or seven in number, are of a greenish colour thickly spotted with black.

CARIBBÆUS. Above ferruginous, beneath white; head, neck, and tail cuneiform, and striated with blue and white; collar and spot on the hind head white. Gmel. *Galgulus antillarum*, Briff. *Pie des antilles*, Buff.

This is the same size as the common magpie. The bill and legs are red; spot on the hind head in the male transversely lineated with black; rump and under tail-coverts yellow, the quill-feathers blueish-green; lesser wing-coverts chestnut, green in the middle, the greater wing-coverts blue with the shafts and edges whitish. In the female the greater wing-coverts are green. Described from Du Tertre's History of the Antilles.

AFRICANUS. Above brown, beneath fordid greyish; head somewhat crested, and with the neck purple; tail cuneated and white at the tip. Gmel. African crow.

The length of this bird is twenty-two inches, the bill and legs red; feathers of the hind head tipped with grey; quill-feathers blueish at the outer margin. An African species.

ZANOE. Blackish; head and neck somewhat fulvous; tail long. Gmel. *Pica mexicana minor*, Briff. *Tzanaboci*, seu *Pica Mexicana Hernand.* Ray. *Zanoe*, Buff. Lesser Mexican crow.

Inhabits Mexico, where it is said to have all the manners of the magpie, as well as cunning, and learning to talk like that bird; its natural cry is not unlike that of a starling.

BRACHYURUS. Green beneath; and lines on the head tawnyish; wings with a white spot. Gmel. *Merula viridis moluccensis*, Briff. *Pica indica vulgaris*, Ray. *Breve de Bengale*, & *merle de Bengale*, Buff. Short-tailed crow.

This is the size of a blackbird; the bill grey-brown, with the corners of the mouth orange; irides whitish; head and throat black; over each eye a fulvous stripe, from the nostrils to the hind head; back part of the neck, back, and scapulars fine green; throat, neck, breast, belly, sides, and thighs fulvous; lesser wing-coverts shining blue-green; quills black, on the first six a white spot about the middle; tail about an inch in length, black, with the tip green; legs orange; claws dirty red. Inhabits the Molucca isles.

There are several varieties of this species, the principal of which are the following:

β. *Corvus Philippensis*, Gmel. *Breve des Philippines*. The colour of this is green, with the head and neck black; rump and wing-coverts blueish-green; tail black; under-coverts rosy.

γ. *Corvus Bengalensis*, Gmel. *Breve*, Buff. Madras jay of Ray, and Bengal quail of Albin. This inhabits Ceylon; the colour is green, beneath yellowish; head and neck black, streaked with orange and white; quill and tail-feathers black. Klein calls this *coturnix capensis*.

δ. *Corvus Madagascariensis*, green, beneath yellowish; head blackish brown; nape yellowish; black lunule on the neck, behind, and two bands of the same colour beneath the eyes.

ε. *Breve de Malacca*, Sonnerat. This has the head and

neck black; eye-lids green, edged with blue; chin white; throat and back greenish; abdomen rufous; vent red. A native of Malacca.

ζ. *Breve de la côte de Malabar*, Sonnerat. The head and neck of this bird are black, with the crown and longitudinal band rufous; throat white; breast reddish; abdomen, thighs, and vent red. Found on the coast of Malabar.

η. *Chinense short-tailed crow*. Green; crown fuscous; neck and collar white; nape and stripe through and round the eyes black; abdomen white; abdominal spot and vent scarlet. This elegant variety is described on the authority of a drawing in the collection of the late Dr. Fothergill. It is a native of China.

The short-tailed crows are in general small birds not exceeding the length of six or seven inches.

CANADENSIS. Fuscous; front yellowish, beneath, and tail-feathers at the tip white. Gmel. *Garrulus canadensis fuscus*, Briff. *Geay brun de Canada*, Buff. Cinereous crow.

This bird inhabits Canada, and is frequent near Hudson's bay, where it is known by the name of Whiskijohn, and Whiskijack; they breed early in spring, and build in pine-trees. The young brood seldom consists of more than two or rarely three. Their food moss, worms, and flesh. It is rather smaller than the common jay.

PYRRHOCORAX. Blackish; bill pale-yellow; legs black. Gmel. *Choucas des Alpes*, Buff. Alpine crow.

Inhabits the Alps, and measures about 15 inches in length.

GRACULUS. Violet-blackish; bill and legs red. Gmel. *Coracias*, Aldr. Cornish chough.

Length 16 inches. This species inhabits the Alps, and other parts of Europe, and is also found in Egypt and Persia. They build chiefly in rocks, and feed on berries and insects.

AUSTRALIS. Above black; beneath cinereous, with the bill red; wing-coverts spotted with white; tail rounded. Gmel. Cayenne red-billed crow.

This is about the size of the Mistle-thrush, &c. eleven inches in length. The bill is an inch and a half long, and curved, the colour red, and resembling fine sealing-wax; the legs are dusky; claws black. The native place of this bird is uncertain; it is supposed to be Cayenne.

EREMITA. Greenish; head yellowish; hind-head somewhat crested; bill and legs red. Gmel. *Upupa eremita*, Linn. *Corvus sylvaticus*, Gmel. Wood crow of Gesner. Will. Hermit crow. Lath.

Inhabits the Helvetian mountains, and is about the size of a common hen. They build in rocks and ruined buildings. In Switzerland it is known by the name of waldrapp, and steinrapp. Linnæus places this bird in the genus upupa, Brisson in that of coracias, and Barrere calls it a species of curlew. Gmelin and Latham refer it to the genus corvus.

CORVUS aquaticus, Pelicanus carbo of Linnæus, the name given by authors to the bird commonly known by the name of the cormorant, or corvorant, on account of its voraciousness, which is owing to a great quantity of small worms filling its intestines, and causing a very sudden digestion. This bird has a rank smell, disagreeable form, and hoarse, croaking voice. It is of the size of a goose, and is of a very deep dusky brown on the back, with some admixture of a greenish gloss, and white on the belly and breast. It builds not only among rocks, but often also on trees. These birds have been trained to fish, and are used by the Chinese for this purpose.

Dr. Porterfield, (Treatise on the Eye, vol. ii. p. 265.) observes that the crystalline humour in this bird, and in

other animals that dive in pursuit of their prey under water, and that should see both when in water and upon land, is of a middle figure betwixt that of a lens and a globe; but this figure, it is evident, must refract the rays too much when upon land, and too little when in water. However, as they possess the power of changing the conformation of the eye, they are enabled to see distinctly enough both on land and in the water. Thus the cormorant is able to pursue its prey under water with such nimbleness and activity, and for a long time, till at last it catches it with surprising dexterity; hence, after putting an iron ring at the bottom of its neck, so that the fish, being received into the oesophagus, which is very large, may not descend into the ventricle; it is frequently employed in fishing, and is said to afford a very agreeable diversion. After it has seized the fish, it is said always to throw it up into the air, and to catch it again by the head, as it falls down, that it may swallow it entire, or without loss of time; but, because of the ring about its neck, the fish gets no further than its gullet, which, being large and yielding, stretches into a large pouch or bag, in which the fish remain, till the bird is forced to come to land and to throw them up entire. The Greenlanders eat its flesh, clothe themselves with its skin, and use the bag under its throat for a purse. See PELECANUS *carbo*.

CORVUS aquaticus, the *water-raven*, is also a name given by some authors to the *acacalotl*, the Mexican Ibis of Latham, and the *TANTALUS Mexicanus* of Gmelin, which see. It is a very beautiful Mexican water bird, of a shining, greenish, purplish hue. It feeds on fish, and is eaten, but is of a coarse and fishy taste.

CORVUS aquaticus minor, a name by which Mr. Ray has very properly called a bird common on our northern coasts, called there the *slagge*, and in some places the *crane*, the PELECANUS *Graculus*; which see.

CORVUS bengalensis, the Bengal roller of Latham, and the *CORACIAS bengalensis* of Gmelin. See CORACIAS.

CORVUS cornutus, a name by which some have called the Indian raven, with the horned beak, more usually called the RHINOCEROS *bird*, which see. This is a species of *Buceros*.

CORVUS aegyptius of Hæffelquist, an Egyptian bird of the size of the lark; the Egyptian Grackle of Latham, and the *GRACULA Atthis* of Gmelin, which see.

CORVUS fluviatilis, the *river-raven*, a name given by some writers to a very remarkable bird of the Philippine islands, resembling the common raven, but being of the amphibious kind. It is called in the language of the place *caffili*, or *Colocolo*.

CORVUS Indicus, the name of a bird of the raven kind, very common in the Molucca islands, very large, and armed with a very strong beak and claws; it does not feed on carrion, as our raven, but eats the nutmegs, and does vast damage in destroying that fruit. Its flesh is very delicate, and has plainly the aromatic flavour of its food; this is the Indian Hornbill of Latham, the *Hydrocorax* of Brisson, and the *BUCEROS hydrocorax* of Gmelin.

CORVUS Paradisi, the Paradise fly-catcher of Latham, the pied-bird of Paradise of Edwards, the *Muscicapa Paradisi* of the System. Nat. and the *TODUS Paradisi* of Gmelin.

CORVUS Rufficus of S. G. Gmelin, *CORVUS insauillus* of Fn. Succ., *Merula fasciata* of Gesner, Ray and Brisson, the greater Redstart of Albinus and Willughby, and Rock thrike of Latham, is the *LANIUS insauillus* of Gmelin; which see.

CORVUS sylvaticus, the *wood-raven*, the name of a bird described by Gesner, and supposed by Mr. Willughby to be no other than the *coracias* or *pyrrhocorax*, the *CORVUS gra-*

culus of Gmelin; but, if rightly described, it differs essentially from that bird in size, and in having a crest on its head. Gesner says, it is of the size of the common hen; it appears at a distance of a deep black, but, when viewed nearer, and in the sunshine, it appears of a fine glossy green; its tail is short; its toes very long, and not webbed; and it has a crest on its head. It feeds on frogs, fish, and other small animals, and builds in the ruins of old buildings, and lays two or three eggs. They fly very high; the young ones are accounted a very well tasted food. This is the *CORVUS Eremita* of Gmelin.

CORWEN, in *Geography*, a neat town on the banks of the Dee, over which is a handsome bridge, at the extremity of Merionethshire, and close to the borders of Denbighshire; built on a rock at the foot of Berwyn hills. This was the territory of that renowned hero Owen Glendower, the formidable opponent of Henry IV. in the 14th century, whose gigantic features still decorate the sign-post of the principal inn, and whose whole district yet bears the name of Glendwr-dwy, or the valley of the Dee. Near this town is the pass of Glyndyffis, over which the great Irish road is conducted with singular contrivance, so as to escape the danger and yet to follow the winding of the torrent that precipitates from the hills with great force. The lands about Corwen are very fertile, and finely variegated with four deep and narrow vallies on each side, verging towards it, as the central point of a star, while the naked and intervening hills gradually expand themselves before the eye till they are terminated by the horizon. Corwen is remarkable for having been the place where the Welsh forces under Owen Gwynedd stopped the invasion of Henry II. in 1161. At present it is a place of fashionable resort for anglers, who fish for trout, grayling, salmon, &c. the whole parish of Corwen contains, by the returns to the population act, 41 Geo. III., 251 houses, and 1369 inhabitants.

CORY, in *Ancient Geography*, the name given by Ptolemy to an island of the East Indian ocean, in the Argaric gulf, N. of the isle of Taprobana.—Also, a promontory of the peninsula on this side of the Ganges, called also *Colis*, and opposite to the northern point of Taprobane. Ptolemy. The island is now called Ramankoil, or the temple of Rama. The ridge of rocks extending from this island to Manar, on the island of Ceylon, denominated Adam's bridge, should be entitled, as sir William Jones maintains, Ramah's bridge; the present name of this promontory and island strengthen his remark, it being usual in the Oriental dialects to confound the D and R.

CORYBANTES, in *Antiquity*, priests of Cybele, who danced and capered to the sound of flutes and drums. See CROTALUM. (Horace, lib. i. ode 16. ver. 8.) They inhabited mount Ida in the island of Crete, where they are said to have nourished the infant Jupiter, drowning his cries by the tinkling of their cymbals, so that his father Saturn, who had determined to devour all his male offspring, might not hear them. The account of them occurs under different names of Curetes, Galli, and Içæi Dactyli, as well as Corybantes.

Catullus, in his poem called *Atys*, gives a beautiful description of them: representing them as madmen. Accordingly Maximus Tyrius says, that those possessed with the spirit of Corybantes, as soon as they heard the sound of a flute, were seized with an enthusiasm, and lost the use of their reason. And hence the Greeks use the word *κορυβαντιζειν*, to *corybantize*, to signify a person's being transported, or possessed with a devil. See ENTHUSIASM.

Some say that the Corybantes were all eunuchs; and that

what it is on this account Catullus, in his *Atys*, always uses feminine epithets and relatives in speaking of them.

Diodorus Siculus remarks, that Corybas, son of Jason and Cybele, passing into Phrygia with his uncle Dardanus, there instituted the worship of the mother of the gods, and gave his own name to the priests. Strabo relates it as the opinion of some, that the Corybantes were children of Jupiter and Calliope, and the same with the *Cabiri*. Others say, the word had its origin from this, that the Corybantes always walked dancing (if the expression may be allowed) or tossing the head. *κορυβαντες βαινοειν*.

CORYBANTICA, a festival held in Crete, in memory of the Corybantes, who educated Jupiter when he was concealed in that island, from his father Saturn, who would have devoured him.

CORYBANTIUM OPPIDUM, in *Ancient Geography*, a name given to the town of Samos, in the isle of Samothrace.

CORYBISSA, a place of Asia, in Scepria, a country of the lesser Myfia, on the river Eurycis, according to Strabo.

CORYCE, a promontory of the isle of Crete.—Also, a port of Ethiopia.—Also, a town of Pamphylia, situated in the vicinity of Attalæa.—Also, a mountain of Ionia, on the sea coast, opposite to the isle of Chios. On this mountain was a cave, famous on account of the Birth of Herophila, the Erythræan sibyl.

CORYCEUM, in *Antiquity*, that part of the gymnasium where people undressed. It was otherwise called **ΑΡΟΥΤΕΡΙΟΝ**.

CORYCIDES, in *Mythology*, nymphs, the supposed daughters of a nymph beloved by Apollo, so called from the grotto of *Corycium*.

CORYCIUM, in *Botany*, (from *καρυκος*, a helmet, alluding to the structure and position of the flower.) Willd. 594. Swartz. Aët. Holm. 1800. p. 220. Tracts on Botany, 146. Class and order, *gynandria mouandria*. Nat. Ord. *Orchidæ*, Linn. Juss.

Gen. Ch. *Cal.* none. *Cor.* (Calyx, Juss. Swartz.) Petals four, erect; two exterior; one of them superior, narrower; the other inferior, inversely egg-shaped; the two others lateral, interior larger, reflex, ventricose-concave at the base, connected with the upper exterior petal, and forming a kind of helmet; lip of the nectary with an attenuated base, inserted at the tip of the style above the anther, folded back, spreading. *Stam.* Anther adnate to the middle of the style under the lip of the nectary, didymous, two-celled; cells rather remote, covered behind by the wings of the style; pollen-masses pedicelled. *Pist.* Germ inferior, oblong, twisted, style erect, very short, narrower at the base, obtuse and ringed at the tip; wings lateral, deflexed; stigma behind, convex (towards the helmet) below the cells. *Peric.* Capsule oblong, twisted, one-celled, three-keeled, three-valved, dehiscing at the angles under the keels, coherent at the apex and base. *Seeds* numerous, very small, resembling saw-dust.

Ess. Ch. Corolla ringent; petals four, erect; the lateral ones swelling at the base; lip of the nectary inserted into the style above the adnate anther.

Sp. 1. *C. orobanchoides*. Willd. 1. Swartz. Aët. Holm. 1800. p. 222. (*Satyrion orobanchoides*: Linn. jun. Supp. 402. Thunb. prod. 6) "Leaves linear, in two rows; helmet with two spurs." *Root* perennial. *Flowers* densely intricated in two opposite rows, forming a spike longer than the stem. 2. *C. crispum*. Willd. 2. Swartz. Ibid. *Arethusa crispa*; Thunb. prod. 3.) "Leaves oblong-lanceolate, undulate-curved at the edges." *Root* perennial. *Stem* many-leaved. *Spike* many-flowered, dense. 3. *C.*

vestitum. Willd. 3. Swartz. *ibid.* (*Ophrys volucris*; Thunb. prod. 2.) "Leaves oblong, sheathing the stem, and forming a kind of hood, spotted; spike cylindrical." *Root* perennial. 4. *C. bicolorum*. Willd. 4 Swartz. (*Ophrys bicolor*; Thunb.) "Leaves sword-shaped, somewhat undulate." *Root* perennial. All the species are natives of the Cape of Good Hope.

CORYCIUM ANTRUM, in *Ancient Geography*, a cave or grotto on mount Parnassus, about 60 stadia from Delphi, on the ascent of the hill.

CORYCUM, or **CORYCEUS**, a small town in Asia Minor, in Ionia. Strabo says that Attalus Philadelphus fixed a colony here. This is supposed to be the same with **CORYCEUS**.

CORYCUS, a town of Asia, in Cilicia, celebrated under the Roman emperors, who always kept a fleet in its port, which was considerable. The inhabitants of this city were governed by their own laws; and it was deemed an asylum to those who resorted thither. It was episcopal according to the acts of the council of Constantinople, held here in the year 381.—Also, a promontory of Cilicia, situated E. of the river Calycadurus, and of the promontory Anemurium, according to Strabo. This author adds, that the "Corycium antrum" of Cilicia was situated at the distance of 20 stadia from the sea.—Also, a mountain of Asia Minor, in Ionia; which, according to Strabo, was very high, and had below it the port of Casytes, and that of Erythræ.—Also, a port of Asia Minor, in Ionia, at the foot of mount Corycus.—Also, a town of Asia Minor, in Lycia, between Olympus and Phafelis.—Also, a mountain of the isle of Crete;—and also a port of Ethiopia.

CORYCEUS, whence **CORYCOMACHIA**, among the Greeks, a kind of exercise with the hand-ball. The size of the ball, and the materials of which it was prepared, were adapted to the age and strength of those who used it. It was suspended from the ceiling, and thrown off with different degrees of force, so that on its return it might act with proportionable violence. It was recommended by the physicians as a salutary exercise. Hoffman.

CORYDALEPODIUM, in *Botany, a name given by some authors to the *delphinium*, or *larkspur*.*

CORYDALES, the twenty-eighth natural order of Linnæus in the *Systema Naturæ*, and the twenty-fourth of the Posthumous Prælections. In the former it consists of the following genera: melianthus, epimedium, hypecoum, fumaria, impatiens, leontice, monotropa? utricularia? tropæolum? pinguicula. In the latter: melianthus, monniera, epimedium, hypecoum, fumaria, leontice, impatiens, utricularia, calcolaria? pinguicula. *Tropæolum* is removed to the order trichilatæ. Linnæus acknowledges that he does not find in this order any common mark, much less a difference from the other orders; but observes, that they have a degree of brittleness or tenderness distinct from all others, which, with their glaucous colour, indicates an affinity at first sight.

CORYDALIS, a name given by the old botanists to the genus *fumaria*.

CORYDALIS fungosa; Vent. Choix de plantes 19. See **FUMARIA fungosa**.

CORYDALLA, in *Ancient Geography*, a town of Asia Minor, in Lycia; called by Ptolemy *Corydallus*.

CORYDALLUS, a borough of Greece, in Attica, near Athens, belonging to the Hippothoote tribe.—Also, a mountain of Attica.

CORYLEUM, a village of Asia Minor, in Paphlagonia; named *Coryle* by Xenophon.

CORYLUS, in *Botany*, (*καρυα*, Theoph. Discor.) Tourn. Cl. 19. § 1. gen. 2. Linn. Gen. 1074. Schreb. 1450. Willd.

1699. Gært. 577. Juss. 410. Vent. 3. 562. (Noiffetti; Encyc.) Class and order, *monocia polyandria*. Nat. Ord. *Amentaceæ*, Linn. Juss.

Gen. Ch. *Male flowers* in a long cylindrical imbricated amentum. *Cal.* Scale one-flowered, narrowed at the base, obtuse, three cleft; middle division equal in length to the others, but twice the breadth, and covering them. *Cor.* none. *Stam.* Filaments eight, (six or eight; Gært.) very short, attached to the inner side of the calycine scale; anthers ovate-oblong, shorter than the calyx, erect. *Female flowers* remote from the males, in a very small somewhat globular amentum, sessile, included within the bud. *Cal.* Perianth bifid, leathery, erect, lacerated on the margin, scarcely visible during the time of florescence. *Cor.* none. *Pist.* Germ roundish, very small; styles two, much longer than the calyx, coloured; stigmas simple. *Peric.* Nut egg-shaped, appearing rasped at the base, somewhat compressed towards the summit, surrounded by the greatly enlarged calyx. *Seed* solitary, very rarely two in a nut.

Inf. Ch. Calyx of the male a three-cleft one flowered scale. Corolla none. Stamens six or eight. Calyx of the female bifid, lacerated. Corolla none. Styles two. Nut egg-shaped, even-surfaced, one-celled, surrounded by the much enlarged coriaceous calyx.

Sp. 1. *C. avellana*. Linn. Sp. Pl. 1. Mart. 1. Poir. 1. Willd. 1. Gært. tab. 89. fig. 3. Lam. Ill. Pl. 780. "Stipules egg-shaped, obtuse; leaves roundish, heart-shaped, acuminate; branchlets hairy." *a. sylvestris*. Bauh. Pin. 418. 5. Tourn. 582. Eng. Bot. 723. Common hazel-nut tree. *β. grandis*. Sativa, fructu rotundo maximo; Bauh. Pin. 418. 2. Cob-nut tree. *γ. glomerata*. Nucibus in racemum congestis; Bauh. Pin. 418. 4. Clus-ter-nut tree. A low tree. *Leaves* alternate, on short petioles, doubly ferrated, heart-shaped, and narrowed at the base, pubescent, particularly underneath. *Flowers* appearing before the expansion of the leaves; male catkins terminal, somewhat panicled, cylindrical, pendulous, tremulous, many-flowered, yellowish; scales pubescent on the outside, fixed to a common receptacle, not deciduous; female flowers few, included in solitary, lateral, imbricated, egg-shaped buds; styles scarlet, exserted; calyx at first small, afterwards, as the fruit ripens, much enlarged, coriaceous, two-lobed, lacerated at the tip. *Nut* egg-shaped, even-surfaced, hard, esculent. A native of woods and hedges in Great Britain, and other parts of Europe. The kernel is very generally eaten, on account of its agreeable flavour, but contains little nourishment, is of difficult digestion, and produces unpleasant effects on weak stomachs. A sweet oil is extracted from it when dry, which is of an anodyne nature, and is found serviceable in obstinate coughs. Several improved varieties have been produced by cultivation and importation from more favourable climates. The trivial name adopted by Linnæus is said to be derived from Avelino, in the kingdom of Naples, but is rather improperly applied to our wild hazel-nut, as the nuts cultivated in the neighbourhood of that city are of the large kind, generally known in England by the name of Spanish nuts, and said to have been originally imported by the Romans from Pontus. The trees are an excellent under-wood, and are cut down periodically for poles, fishing-rods, waling-sticks, &c; their tough and flexible texture renders them peculiarly fit for wattle hurdles, crates, and springles to fasten down thatch. They likewise burn into an excellent charcoal. 2. *C. tubulosa*. Willd. 2. (*C. avellana* *β* and *γ*; Linn. Mart. Poir. *C. sativa*, fructu albo minore, sine vulgaris; & *C. sativa*, fructu oblongo rubente; Bauh. Pin. 418.) Filbert tree. "Stipules oblong, obtuse; calyx of the fruit

tubular-cylindrical, pressed close, and gash-toothed at the tip; leaves roundish, heart-shaped, acuminate." Willdenow asserts that this is not, as Linnæus and other authors have supposed, a variety of the preceding species, since it constantly preserves the distinguishing character when raised from seed. Miller had already made the same observation, to which Dr. Smith, in his English Botany, has in some degree given his sanction. 3. *C. americana*. Willd. 3. Mich. Amer. 2. p. 201. *C. americana* humilis; Wangenh. Amer. 88. tab. 29. fig. 63. "Calyx of the fruit roundish-campanulate, larger than the nut; border dilated, tooth-ferrated; leaves roundish, heart-shaped, acuminate." A low shrub. Taken up by Willdenow from a dried specimen sent from Canada, which had not preserved its stipules; but as he has applied the synonym from Michaux also to the next species, and, by a strange inadvertence, has copied *verbatim* the specific character of that author under both, in the same page, and at the distance of only a few lines, further observation must determine whether they be really distinct. 4. *C. rostrata*. Mart. 2. Hort. Kew. 3. 364. (*C. americana*; Poir. ?) "Stipules lanceolate; leaves oblong-heart-shaped, acute; branchlets smooth; calyx of the fruit beaked." Hort. Kew. "Stipules lanceolate; leaves cordate-acute; fruit solitary." Poir. This species is remarkable for the length of the calyx, which, as in the filbert, continues to cover the fruit after it is ripe. It differs from the preceding, according to Poirét, in having the amenta of the flowers, especially of the males, solitary. He believes the plant from which he formed his description to be the same with that of Ayton, in the Hortus Kewensis; it being cultivated in the garden of the museum of natural history at Paris, from seeds sent several years ago from England. A native of North America. 5. *C. colurna*. Linn. Sp. Pl. 2. Mart. 3. Poir. 2. Willd. 5. (*C. bizantina*; Herm. Lugdb. 91. Seb. Mus. 1. tab. 27. fig. 2. *Avelana peregrina* humilis; Bauh. Pin. 418. *A. pumila bizantina*; Clus. Hist. 1. 11.) "Stipules linear, acute; calyxes deeply cut; fruit very large." Linn. and Poir. "Stipules lanceolate-acuminate; calyx of the fruit double; outer one with many divisions; inner one with three; segments palmate; leaves roundish, ovate, heart-shaped at the base." Willd. It differs from *C. avellana* chiefly in its fruit, which is rounder, twice as large, and entirely covered by the calyx. A native of the country about Constantinople.

CORYMBIA, one of the names given to the isle of Rhodes.

CORYMBIFER, in *Mythology*, an epithet of Bacchus, in allusion to the ivy-leaves which adorned his crown, and because the ivy was sacred to him.

CORYMBIFERA, in *Botany*, *millefolii umbella*; Rai. See *ACHILLEA macrophylla*.

CORYMBIFERÆ, the third natural order of the tenth class in the system of Jussieu. It consists of such dicotyledonous monopetalous plants as have perigynous stamens, with the following distinguishing characters. *Flowers* either all stamulous, consisting entirely of regular tubular florets; or radiate, *i. e.* with the florets of the disk regular, and those of the ray irregular, and strap-shaped. The florets of the former are most generally all hermaphrodite; the inner ones are sometimes hermaphrodite, and the outer ones female or neuter; in a few instances, the inner ones are simply male, and the outer ones female. The florets of the latter are never all hermaphrodite; but have often regular hermaphrodite florets in the disk, and strap-shaped female, rarely neutral florets in the ray; or sometimes male florets in the disk, and female fertile ones in the ray. *Common calyx* one or many-leaved, simple, or calyced, or imbricate; generally

rally many-flowered. *Common receptacle* naked, or hairy, or chaffy. *Regular flowers* most frequently quinquefid, rarely quadrifid, or trifid. *Strap-shaped florets* entire, or toothed. *Stamens* in the female and neutral florets none; in the hermaphrodite and male ones five, rarely four; anthers united into a tube, very rarely distinct and approximate. *Stigma* a continuation of the style, without a joint. double in the hermaphrodite and fertile female florets; simple in the male; simple or none in the abortive female ones. Seed naked or crowned. *Stems* generally herbaceous, sometimes shrubby, or inclining to shrubby, almost always branched. *Leaves* in most cases alternate, in a few opposite. *Flowers* generally yellow, or purple; florets of the disk generally yellow; of the ray often of the same colour with the disk, but sometimes of a different colour.

Vaillant first called the flowers of this order corymberiferous, because they most commonly form a corymb, sometimes widely spreading, and sometimes compact. They comprehend all the radiate, and many of the flosculous flowers of Tournefort, which Jussieu asserts cannot be separated, since genera in both are nearly allied to each other, as bidens and verbesina, anacyclus and anthemis, &c. and since flowers of both kinds are sometimes found in the same genus, as in tussilago, fenecio, &c. They include all the compound flowers of Linnæus, with the exception of the capitate and femiflosculous, which compose the first two divisions in his natural order compositæ; and constitute more or less of all the six orders of his artificial class syngenesia.

As the genera are numerous, Jussieu divides them in the following manner: I. *Receptacle naked. Seed pappous. Flowers flosculous (radiate in nutifia, barradesia, and leysera). Kubnia, cacalia, eupatorium, ageratum, elephantopus, chiquiraga, nutifia barnadesia, xeranthemum, gnaphalium, filago, leysera, shavia, scripium, stabe, conyza, baccharis, chryfocoma.* II. *Receptacle naked. Seed pappous. Flowers radiate (some of the species in tussilago and fenecio are destitute of a ray). Erigeron, alter, solidago, inula, perdicium, tussilago, brachyglottis, fenecio, cineraria, othonna, didelta, tagetes, pectis, bellium, doricum, arnica, gortenia.* III. *Receptacle naked. Seed not pappous. Flowers radiate.* Osteospermum, calendula, madia, chrysanthemum, matricaria, bellis, cenia, lidbeckia. IV. *Receptacle naked. Seed not pappous. Flowers flosculous.* Cotula, adenostemma, struchium, grangea, ethulia, carpesium, hippia, tanacetum, artemisia. V. *Receptacle chaffy. Seed not pappous. Flowers generally radiate, rarely flosculous. (Tarchonanthus, calea, and athanasia are slightly pappous.)* Tarchonanthus, calea, athanasia, micropus, fantolina, anacyclus, anthemis, achillea, eriocephalus, bupththalmum, osmites, encelia, sclerocarpus, unxia, flaveria, milleria, figisbeckia, polynnia, baltimora, elipta. VI. *Receptacle chaffy. Seed toothed or chaffy at the tip. Flowers in most radiate, in a few flosculous. (The receptacle of helenium almost naked).* Spilanthus, bidens, verbesina, coreopsis, ziuma, balleria, silphium, melampodium, chryfogonum, helianthus, helenium, rudbeckia, tithonia, galardia, wedelia, oedera, agriphyllum. VII. *Receptacle chaffy. Seed pappous; pappus plumose, capillary, or awn-like. Flowers often radiate.* Arctotis, tridax, amellus, paradysum, ceruana. VIII. *Anomalous. Anthers approximate, not united. Calyx monoicous.* Iva, clivadium, parthenium. IX. *Anomalous. Anthers approximate, not united. Calyxes dioicous.* Ambrosia, xanthium, nephelium. The first two are removed by Ventenat to urticæ.

Ventenat has retained the order, but has omitted some of Jussieu's genera, added others, and given a different arrangement to the whole. It stands thus in his "Tableaux du regne Vegetal." I. *Receptacle naked. Seeds pappous. Flowers flosculous.* A. Scales of the calyx not shining. Cacalia, eupa-

torium, ageratum, conyza, baccharis, chryfocoma. B. Scales of the calyx scarious, or membranous and shining. Elichrysum, filago, argyrocome, antennaria. II. *Receptacle chaffy. Seeds naked, or very rarely almost naked. Scales of the calyx often scarious.* Micropus, evax, gnaphalium, xeranthemum, athanasia, fantolina, anacyclus. III. *Receptacle chaffy. Seeds naked. Flowers radiate.* Anthemis, achillea, eriocephalus, bupththalmum, encelia, milleria, figisbeckia, polynnia, baltimora, elipta. IV. *Receptacle chaffy. Seeds either toothed or awned. Flowers almost always radiate.* A. Flowers flosculous, epilanthus, bidens. B. Flowers radiate, verbesina, coreopsis, sanvitalia, zinnia, silphium, helianthus, helenium, rudbeckia, galardia, aleina, agriphyllum. V. *Receptacle chaffy, rarely villous. Seeds pappous. Flowers radiate.* A. Receptacle villous. Arctotis. B. Receptacle paleaceous. Ursinia, tridax, amellus. VI. *Receptacle naked. Seeds pappous. Flowers radiate (Flosculous in some species of fenecio and tussilago).* Erigeron, alter, solidago, inula, pulicaria, tussilago, fenecio, cineraria, othonna, tagetes, pectis, bellium, doricum, arnica, gorteria. VII. *Receptacle naked. Seeds not pappous. Flowers radiate.* Osteospermum, calendula, madia, chrysanthemum, pyrethrum, matricaria, bellis, cenia, ledbeckia. VIII. *Receptacle naked. Seeds not pappous. Flowers flosculous.* Cotula, grangea, carpesium, tanacetum, balsanita, artemisia. IX. *Receptacle villous. Seeds not pappous. Flowers flosculous.* Alsinthium, tarchonanthus. X. *Anomalous. Anthers distinct.* Iva, parthenium. The genera printed in Italics occur in the arrangement of only one of the French botanists.

CORYMBIUM, in Antiquity, an ornament of hair worn by the women. Its form was that of a corymbus.

CORYMBIUM, in Botany (from κορυμβος, a corymb), Linn. Gen. 1004. Schreb. 1361. Willd. 408. Gært. 547. Juss. 176. Corymbioid; Enc. Clafs and order, syngenesia monogamia, Linn. Pentandria monogynia, Willd. Nat. Ord. Composite discoidæ, Linn. Cinarocephale anomale, Juss.

Gen. Ch. Cal. two-leaved, one-flowered, inferior, long; prismatic, six-angular; leaflets erect, converging longitudinally, triangular at the back, truncated, obscurely three-toothed; with a calycle consisting of four or five very small leaves or scales. Cor. monopetalous, regular; tube very short; border with five oblong spreading segments. Stam. Filaments five, simple, erect, attached to the tube; anthers oblong, erect, united into a hollow cylinder. Pist. Germ within the calyx, inferior to the corolla, hirsute; style simple, erect; stigma bifid. Peric. none, except the unchanged calyx (utricle hairy, closely investing the seed, Gært.) Seed single, oblong, almost the length of the calyx, covered with a wool resembling down (crowned with a pitcher-shaped chaffy calycle, Juss.)

Elf. Ch. Calyx inferior, two-leaved, prismatic. Corolla funnel-shaped, superior. Seed woolly.

Sp. 1. C. scabrum. Linn. Syst. Nat. 1. Mart. 1. Lam. 2. Willd. 1. Lam. III. Pl. 723. fig. 1. Burm. afr. 187. tab. 70. fig. 1. (Bupleurifolia; Pluk. alm. 73. tab. 272. fig. 5.) "Leaves linear, channelled, nearly smooth; stem, bractes, and calyxes villous-scarious." Root perennial, with a thick, very woolly crown. Stem a foot high, reddish, cylindrical. Root-leaves slightly striated, shorter than the stem. Flowers purple, in very close, erect, terminal fascicles, disposed in a corymb. 2. C. glabrum. Linn. Syst. Nat. 2. Mart. 2. Lam. 3. III. Pl. 723. fig. 2. (Bupleuro similis; Pluk. alm. 73. tab. 272. fig. 4.) "Quite smooth; leaves sword shaped, flat, nerved." Crown of the root and base of the leaves very woolly. Stem nearly cylindrical, about a foot high. Root-leaves from seven to nine inches long, five or six lines broad. Stem-leaves short, acute, embracing the stem, a little villous at their axils.

axils. *Flowers* in numerous fascicles, which compose a loose, rather large, terminal corymb or panicle. 3. *C. gramineum*; Lam. 1. Ill. Pl. 723. fig. 3. (*C. filiforme*; Linn. jun.?) "Leaves linear, nerved, quite smooth, erect; corymb smooth, stiff, and straight." Crown of the root very woolly. *Stem* eight or nine inches high. *Root-leaves* a line, sometimes a line and half broad, slightly channelled. *Stem-leaves* alternate, embracing the stem; upper ones gradually lessening into scales. Communicated to La Marck by Sonnerat. 4. *C. villosum*. Linn. jun. Supp. 392. Mart. 4. Willd. 4. "Vil- lous-woolly; stem-leaves embracing the stem, awl-shaped; straight, flat." All the species are natives of the Cape of Good Hope.

CORYMBUS, a corymb (*κορυμβόν*, or *κορυμβός*, a branch or cluster crowning the summit of a plant), is used by Lin- næus to express a particular form of inflorescence, the defini- tion of which is, "a spike whose partial flower-stalks are gradually longer as they stand lower on the common stalk, so that all the flowers are nearly on a level." This is well exemplified in *Spiræa opulifolia*, a frequent shrub in gardens. Other examples of the same are found in the *Tetradynamia* class of Linnæus, as the Wall-flower, Stock, Cabbage, &c. The flowers of the Mountain Ash, and of Yarrow, are also disposed in a corymbose manner, that is, they form a nearly level surface, though their various stalks spring from various points, and are consequently of different lengths. The stalks also in these last-mentioned plants are subdivided, con- stituting a compound corymbus, and differing from a cyme in not originating collectively from any general point of union. See **CYMA**.

The above definition, taken from Linnæus, implies that his own original character of a spike, which requires the flowers to be all sessile (without partial stalks) on one com- mon stalk, was not observed even by himself. Nor indeed can it be rigidly adopted, for the lowermost flowers, even in a true spike, are often stalked, and all of them, though originally sessile, are liable to acquire stalks as they ripen their fruit. A corymb, however, after flowering, becomes a true racemus, or cluster. See **SPICA** and **RACEMUS**. S.

CORYNA, in *Ancient Geography*, a town of Asia Mi- nor, in Ionia, on the sea-coast, between Clazomenæ and mount Corycus.—Also, a town of Peloponnesus in the Elide, at a distance from the sea. Ptolemy.

CORYNEUM PROMONTORIUM, a promontory of Asia Minor, in Ionia, being part of mount Mimas, which ex- tended so far.

CORYNOCARPUS, in *Botany*, (from *κορυνή*, a club, and *καρπός*, fruit.) Forst. Gen. 16. Linn. jun. Supp. 21. Schreb. 394. Juss. 288. Class and order, *pentandria monogynia*. Nat. Ord. *Berberides*, Juss.

Gen. Ch. *Cal.* Perianth inferior, five-leaved; leaves ob- long, concave. *Cor.* Petals five, roundish, narrowed at the base, erect. Nectaries five, petal-shaped, alternate with the petals, nearly the same length, but narrower; each with a globular gland at the base. *Stam.* Filaments five, awl- shaped, attached to the base of the petals; anthers oblong. *Pist.* Germ superior, globular; style short, filiform; stig- ma obtuse. *Peric.* Nut club-shaped, with an oblong kernel.

Eff. Ch. Nectaries five, petal-shaped, alternate with the petal, glandulous at the base.

Sp. *C. levigata*. Forst. Gen. 31. tab. 15. *Leaves* alter- nate, petioled, obovate or wedge-shaped, slightly emargi- nate, entire, veined, quite smooth. *Panicle* terminal, sessile, large. *Flowers* white. A native of New Zea- land.

CORYPHA, (from *κορυφή*, vertex, because it bears its leaves only on the top of the stem.) Linn. Gen. 1221. Schreb. 1690. Gært. 23. Juss. 39. Vent. 2. 124. Class and order, *palma flabellifolia*, Linn. Nat. Ord. *Palma*, Juss.

Gen. Ch. *Cal.* Spathe universal, none. Spathes partial- numerous; alternate, on a common peduncle or spadix, one- leaved, embracing the peduncle, producing panicles of her- maphrodite flowers. Perianth proper, short, with three divi- sions. *Cor.* Petals three, egg-shaped, concave, half open, longer than the calyx. *Stam.* Filaments six, about the length of the petals; anthers almost arrow-shaped, short, versatile. *Pist.* Germ superior, conical; style short; stigma obtuse, pubescent. *Peric.* Berry (Linn. Gært. Juss. Lam. Drupe; Vent.) spherical, smooth. *Seed* solitary, bony; with a white, rather firm kernel.

Eff. Ch. Flowers hermaphrodite. Spathe universal, none. Spathes partial, numerous. Berry or drupe globu- lar. Seed bony.

Sp. 1. *C. umbraculifera*. Linn. Sp. Pl. Mart. 1. Lam. 1. (Coccoloba panna; Rheed. Mal. 3. tab. 1. 12. Talipot; Knox Ceyl. Palma Moutana; Rai. Hist. 1367.) Great fan-palm. "Fronds pinnate-palmate, plaited; pe- tioles ciliate-spinous; spadix erect." *Trunk* sixty or seventy feet high, cylindrical, even-surfaced. *Leaves* eight or ten at the summit of the trunk, fourteen feet broad, and eighteen long exclusive of the petiole, forming a fascicle or head of about forty feet in diameter, really pinnated, but the leaflets are so plaited and joined together, about two- thirds of their length, as to appear palmate or fan-shaped, connected in their upper distinct part by a thread. *Spadix* rising from the centre of the leaves, and in the space of three or four months growing to the height of about thirty feet, conical, entirely covered with close imbricated scales, or partial spathes, branched; branches simple, alternate, covered with similar scales; lower ones twenty feet long; the whole having the appearance of a magnificent chandelier. *Flowers* whitish, in compound panicles, which proceed from the scales of the branches, sessile, several together, in cy- lindrical pendulous spikes. They have so strong and over- powering a scent, that the inhabitants frequently cut down those trees which grow near their houses, soon after the spadix begins to shoot. *Fruit* about an inch and half in diameter, exactly spherical, smooth and even, green, fleshy, succulent, somewhat oily, and rather bitter; not eatable. This palm does not flower before it is thirty-five or forty years old, and is above fourteen months in ripening its fruit, after the first appearance of the spadix. The spadix then withers, and the whole plant presently perishes. A single tree produces more than twenty thousand berries. But though these are of little or no value, the tree itself is far from being useless. Its abundant pith, pounded in a mortar, is made into a tolerable kind of bread, and is very service- able in times of scarcity, when there is a failure of rice. The expressed juice of the tender branches of the spadix, is a powerful emetic, and is said to be beneficial to persons who have been bitten by serpents. A liquor is obtained from the unripe fruit, which soon condenses into a concrete substance, and is medicinally prescribed to facilitate the pas- sage of a dead fetus. This drug is sometimes abused by unhappy females for the purpose of procuring abortion. But the leaves are of most frequent use. One of them re- duced to a roundish form by cutting off the expanding points of the leaflets, will shelter ten or a dozen men from a heavy rain, or the burning rays of the sun. They are sufficiently firm to be employed by the country people for

the covering of their houses, and by the soldiers instead of canvas in the construction of their tents. They are also a kind of natural paper, which requires no previous process to fit it for use; and most of the books which are shewn in Europe for the Egyptian papyrus, are composed of these leaves. The characters are cut by a sharp-pointed iron style, which, penetrating the epidermis, makes indelible marks on a very durable substance. A native of the coast of Malabar, the island of Ceylon, and other parts of the East Indies. 2. *C. rotundifolia*. Lam. 2. (Saribus; Rumph. Amb. 1. 42. tab. 8.) "Fronde orbicular, palmate-peltate, plaited in a radiate form; petioles ciliate-spinous; spadices pendulous." This species was confounded with the preceding by Linnæus, in opposition to Rumphius himself, who thought his saribus distinct from the Codda-panna of the hortus malabaricus. Jussieu suspects it to be so, and Loureiro has confirmed the opinion. But to put the matter out of doubt with European botanists, there is, or lately was, a fine plant of it in the imperial garden at Schoenbrunn, near Vienna, where it was seen by La Marck. It was then young, and had not begun to form a stem. Rumphius has given the following description of it in its state of maturity. *Trunk* thicker and more lofty than that of the Areca. *Leaves* about ten, in a loose fascicle at the top of the trunk, three or four feet in diameter, plaited from a common centre, and diverging in all directions, till they form separate acute leaflets; petioles near six feet long, slightly channelled, bordered by small sharp teeth. *Peduncles* or spadices several, rising from the middle of the leaves, about three feet long, pendulous, reddish. *Flowers* in compound racemes, or long panicles. *Fruit* spherical, scarcely the size of a pistol ball, at first of a beautiful orange colour, which soon becomes black. A native of the Molucca islands, where its leaves and pith are applied to the same purposes as those of the Codda-panna, on the coast of Malabar, &c. The leaves on account of their firmness and pliability are much used to wrap up fruit, tobacco, and other commodities. 3. *C. minor*. Mart. 2. Lam. 3. Jacq. Hort. 3. 8. tab. 8. (*C. pumila*; Walter. *Chamærops acaulis*; Michaux. *Sabal*; Adan. 495. *Sabal Adansonii*; Guersent.) "Fronde palmate, fan-shaped, plaited, somewhat bifid; petioles not spinous." A dwarf plant, with the habit of a *Chamærops*. Crown of the root thick, resembling a bulb. *Leaves* springing from the crown of the root, smooth, rigid, striated, plaited below, and separating upwards into sword-shaped, acute segments; petioles a foot or a foot and half long, even-surfaced, slightly channelled or flat above, round underneath. *Spadix* erect, two or three feet high, rising among the leaves from the crown of the root, clothed with membranous sheathing spathes. "Flowers in paniced racemes, sessile, small, white, without scent; germ trigonous, roundish; style conical, three-furrowed. *Fruit* about the size of a pea, of a sweet taste, smooth, black, not very succulent. A native of marshy ground in Carolina. It flowered first in Europe, in the imperial garden at Schoenbrunn, in 1773. M. Guersent, who has seen the plant flower and fruit several times in the botanic garden at Rouen, follows Adanson in making it a distinct genus, and gives the following as its essential character. "Flowers hermaphrodite; spathes partial; stamens six, and; filaments thickened at the base; germs three, coadunate; berries three, monospermous; two generally abortive; seed bony; embryo lateral." According to this description, it differs from the preceding chiefly in the number of its germs and berries; and in the situation of the embryo, which is said by Gærtner to be at the base of the seed in corypha. But as neither of the Asiatic plants have flowered in Europe, and have not been described

from recent specimens by any modern botanists, it does not appear certain that they also have not abortive germs. And with respect to the situation of the embryo, we cannot think it sufficiently important to be admitted into a generic character. See *Annals of Botany*, vol. ii. p. 199.

CORYPHA, in *Ancient Geography*, a mountain of India, near the Ganges, in which was a temple of Diana Orthia.—Also, a mountain of Asia, in Syria, between Antioch and Berœ; the Coryphæus of Polybius.—Also, a mountain of Asia Minor, in the vicinity of Smyrna.—Also, an ancient name of Libya, a province of Africa.

CORYPHÆNA, in *Ichthyology*, a genus of the thoracic tribe. The fishes of this kind have the head sloping suddenly downwards; the gill membrane furnished with five rays, and the dorsal fin extending the whole length of the back.

Species.

HIPPURUS. Sea-green, spotted with orange; tail forked; dorsal fin with about sixty rays. Gmel. &c. Common coryphene.

The Coryphæne genus is in general distinguished from the peculiar brilliancy of its species, none of which appear, however, in this respect to excel the present kind. The *C. Hippurus* grows to the length of three, four, or five feet, its colour a beautiful blue-green, glossed with gold on the back and sides, and becoming silvery towards the abdomen. The upper parts are marked with a number of round orange-coloured spots; the head large, but short and very much compressed; the lips strong, the mouth wide, and armed with four rows of teeth, which are small and incurved. The fins are green, with a tinge of yellow on the rays. When in the water, this fish appears glossed with the finest golden hue imaginable, and hence it obtains the name of dorado among the Portuguese. But, on being taken out of the water, the beautiful combination of its colours, and golden splendour, gradually fade till the fish expiring, it becomes altogether of a cinereous cast, with scarcely a trace remaining of its original lustre. Our sailors call this brilliant fish the dolphin, but erroneously, the dolphin of ancient writers being of the cetaceous tribe of mammalia. See *DELPHINUS Delphis*.

The coryphæna hippurus is a fish of a strong and vigorous nature, swims with great rapidity, is extremely voracious, and is observed to be perpetually engaged in pursuit of smaller fishes. In the Mediterranean, Indian, and Atlantic seas, which it inhabits, this fish is often seen in large shoals following ships, and devouring, with avidity, any kind of food that may happen to be thrown over-board. Bloch assures us, on the authority of Father Plumier's manuscripts, that in the stomach of a coryphene which he examined were found four nails, one of which measured more than five inches in length.

EQUISELIS. Tail furcated; dorsal fin with about fifty-three rays. Linn. *Guaracapema*, Marcgrave. Brazilian coryphene.

This kind is represented as a most beautiful fish, and as a species allied to the former, though it seems doubtful whether it be a distinct fish, or merely a variety. Marcgrave is the principal author who describes it. This writer informs us, that it is known to the Brazilians by the name of guaracapema, that it grows to the length of six or seven feet, and is of a silvery-green colour on the head, and upper parts, and variegated with numerous blue spots of different sizes, all which are, however, very small, and that the belly is of a whitish colour. He adds, that it is a very swift swimmer, and is considered an excellent fish for the table.

PLUMIERI.

C O R Y P H Æ N A.

PLUMIERI. Variegated with curved blue lines; anal fins with about fifty-three rays. *Coryphæna Plumieri*, Gmel. *Pacu de mer*, Bloch. Plomer's coryphene.

This elegant species is described on the authority of a drawing by Father Plumier, and, in compliment to whom it is named plumieri. According to this naturalist, the fish measures eighteen inches, or more, in length; in its general form, it is allied to the common coryphene, but has the head longer in proportion. The usual colour is bright-yellow, with a silvery cast on the abdomen, and the back brown, variegated with numerous, and somewhat irregular, blue streaks disposed transversely; the fins are yellow, the tail crescent-shaped, edged with blue.

CAERULEA. Entirely blue. Linn. *Novacula caerulea*, Catesby. *Le rafoir bleu*, Bloch. Blue coryphene.

This is an American species; Catesby found it near the Bahama islands, and Plumier about the Antilles. It is easily distinguished from the other species by its uniform blue colour, the breadth of its body, and superior size of its scales. The head is very large, but short, and is covered with smaller scales than those on the body.

NOVACULA. Head and fins cancellated with blue lines. Gmel. Razor coryphene.

This species is described by Salvian as a small fish, scarcely exceeding a palm in length. The head is very large and compressed, as is likewise the whole body, which rises into an edge both above and below; the mouth is rather small, and furnished with sharp teeth, the four anterior ones of which are larger than the rest. The eyes are small and situated on the upper part of the head; the dorsal fin, which is of moderate breadth and red colour, spotted with blue, commences from the back of the head, and is continued nearly to the tail; the vent is placed nearer the head than the tail. The tail is broad, and nearly even at the tip. The general colour of this fish is reddish-yellow. It is a native of the Mediterranean, and feeds on smaller fishes and marine insects.

PENTADACTYLA. Five black longitudinal spots near the head. Gmel. Bloch, &c. Five-spotted coryphene.

The species pentadactyla is a native of the Chinese and Indian seas, and is known in the Molucca isles by the name of banda, ican basida, and ican potou banda. The usual length of this fish is about twelve inches; its habit is similar with the other species in having the head abrupt, and in being deep in proportion to its length, as well as greatly compressed at the sides. The species is of a gregarious nature, and is said by Renard to assemble in such vast shoals about the Molucca islands, that it affords a branch of commerce among those people, almost as important as that of the cod-fishery among the Europeans. Valentine says the flesh is white, firm, and well flavoured.

CHRYSURUS. Golden-yellow; body sprinkled with small blue spots. Cope. *Le coryphene chrysure*. Gilt tail coryphene.

Nearly allied to the common coryphene, but is of a more compressed and lengthened form, and differs in the number and disposition of the teeth, which are very short, small, and acute, and stand apart from each other; the general colour is bright gold, the tail most resplendent and richly glossed with this metallic lustre; throat and breast silvery; the back clouded with blueish, with the rest of the body sprinkled all over with bright blue lenticular spots. This beautiful fish was observed by Commerçon in the Pacific Ocean, and is described from the manuscripts of that navigator by Cope.

POMPILUS. Black with small yellowish bands above the curved lateral line. Linn. Striped coryphene:

This species is shorter and thicker in proportion than the common coryphene, with the head smaller, the mouth more capacious, and the sides of the head marked with several small impressed spots. The lateral line is curved; the pectoral fins very sharp pointed, and the tail lunated slightly. Over each eye is a gold-coloured spot. The fish is a native of the Mediterranean and Atlantic seas.

FASCIOLATA. Milk-white and silvery, with transverse brown circles running from the bands of the dorsal fin, generally coloring on the back, and disappearing on the belly. Pallas, &c.

The length of a specimen of this fish described by Pallas was only two inches, but this was supposed not to have attained its full size. The head is conical, flat above, with the eyes large, and the irides gold-colour; mouth wide; tongue flat and smooth; gill-covers composed of two large rounded plates; lateral line straight; pectoral and ventral fins hyaline; dorsal and anal variegated by dusky bands; tail deeply furcated, and marked by a dusky crescent. It is a native of the seas about Amboina.

VELIFERA. Silvery-ash; dorsal and anal fins very large, and ventral very small. Gmel.

A small species first described by Pallas as a native of the Indian seas. The body is of a tapering form, and covered with eleven longitudinal rows of large thin striated scales, each of which is marked at the base by a small recumbent spine, and is emarginated at the tip.

PSITTACUS. Lateral line intercepted; fins with longitudinal coloured lines. Linn. Parrot coryphene.

Inhabits the American seas, where it was first observed by Dr. Garden, and communicated to Linnæus. The head is finely variegated; the irides a flame-colour edged with blue. On the middle of the body towards the back is a rhomboid purple spot, accompanied by green, yellow, and blue variegations; the dorsal and anal fin are linear, the former commencing from the head, and reaching like the ventral fin to the tail, which is even at the extremity. The colours are evanescent, being observed to vanish as the fish expires.

SCOMBEROIDES. Silvery; back blueish, with the dorsal and anal fin sinuated towards the tail. Cope. *Le coryphene scomberoides*. Mackerel coryphene.

Described by Cope from the manuscripts of Commerçon, who observed it in the South Seas. Its size is between that of a mackerel and a herring; the colour bright silver, tinged with brownish-blue on the back and top of the head, but on the latter darkest, and tinged with golden. All the fins brown, except the ventral, which are white on the exterior sides, the pectoral slightly golden. The lower jaw is longest. The tongue large, and shaped somewhat like the human nail, with a squarish rough bone in the middle. The gill-covers consist of two large, smooth, and rounded plates; and the lateral line is marked by several undulations, which decrease as they approach the tail. The dorsal fin reaches from the back of the head to the tail, and is scalloped towards the posterior part, so as to bear some resemblance to the small or spurious fins in the scombrel or mackerel tribe. Vast multitudes of these fishes were observed by Commerçon to follow the French ships for many days together; they appeared to prey chiefly on young flying fishes, which he says at intervals sprang round the ships like so many butterflies, and which they scarcely surpassed in size.

LINEATA. Head variegated with transverse coloured stripes. Linn. Lineated coryphene.

This species inhabits the seas about Carolina; the head is naked and compressed; the two fore teeth in each jaw longer than

than the rest, and placed at a distance; gill-covers smooth. The head, together with the dorsal and anal fins, are marked by coloured streaks; tail rounded, and body covered with large scales.

JAPONICA. Yellow; aperture of the gills a transverse cleft. Linn. Haarl. Trans. Houtt. Japan Coryphene.

Described by Houttuyn in the Transactions of the Haarlem Society. The species is a native of the Japanese sea, its length six inches, colour deep yellow, and body covered with very thin scales.

In the Linnæan Systema, another coryphene, nearly allied to japonica, is inserted under the name of branchiotege; like the former, it is said to have the aperture of the gills a transverse cleft, and not being distinguished by any other character, we conclude it may be of the very same species. They agree very nearly also in the number of rays contained in each fin, and both inhabit the Asiatic seas.

VIRENS. Greenish, with filiform appendages to the fins. Linn. and Gmel. Greenish coryphene.

The general colour of this fish is greenish, the dorsal fin contains about twenty-six rays; pectoral sixteen; ventral six; anal thirteen, and caudal sixteen. It inhabits the Asiatic ocean.

HEMIPTERA. Jaws nearly equal; dorsal fin short. Gmel. Half-finned coryphene.

Inhabits the Asiatic seas.

ACUTA. Tail sharp-pointed; lateral line convex. Gmel. Sharp-tailed coryphene.

The size of this fish is uncertain; it inhabits the same seas as the former.

SIMA. Tail entire; lower lip longer. Gmel. Flat-nouted coryphene.

This also is a native of the Asiatic seas; the size uncertain. In the dorsal fin are thirty-two rays.

SINENSIS. Silvery-green; ventral fin very short. Cope. Chinese coryphene.

Described by Cope on the authority of a Chinese drawing. The colour is green, more or less deep on various parts of the body, and accompanied by a gloss of silvery. Its dorsal fin is very long, that at the vent, on the contrary, remarkably short; tail rounded; the body, gill-covers, and tail, covered with large scales, the lower jaw longer than the upper, and slightly turned upwards. The drawing from whence this description is taken, formed part of the magnificent collection of the prince of Orange, at present in the National Museum of France.

CLYPEATA. Bony plates between the eyes. Gmel.

An obscure species, said to be distinguished by a long bony process or lamina, situated between the eyes, and is a native of the Indian seas. The dorsal fin has thirty-two rays; the pectoral fourteen; the ventral five; anal twelve; and caudal seven.

The Gmelinian coryphæna rupestris is of a genus altogether distinct from the preceding. This is the berglax or mountain salmon of Northern Europe, and which Bloch considers as forming a genus of itself. In this respect we believe he is perfectly right, or at all events having an example of the fish now before us, we are entirely satisfied it cannot be of the coryphene tribe. See **MACROURUS.**

CORYPHÆUM. in *Ancient Geography*, a mountain of Peloponnesus, in the Argolide, near Epidaurus. On this mountain Diana was worshipped under the appellation of Corypha.

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CORYPHÆUS, in *Entomology*, a species of *scarabeus* with a bicorn thorax, and ferruginous body; found at the Cape of Good Hope. See **SCARABÆUS.**

CORYPHÆUS, formed from *κορυφή*, tip of the head, in the *Ancient Tragedy*, was the chief or leader of the company that composed the chorus.

The coryphæus spoke for all the rest, whenever the chorus took part in the action, in quality of a person of the drama, during the course of the acts.

Hence coryphæus has passed into a general name for the chief or principal of any company, corporation, sect, opinion, &c. Thus, Eustatius of Antioch is called the coryphæus of the council of Nice; and Cicero calls Zeno the coryphæus of the Stoics.

CORYPHANTA, in *Ancient Geography*, a town of Asia Minor, in Bithynia; destroyed in the time of Pliny.

CORYPHANTIS, or **CORYPHAS** of Pliny, a town or village of Asia, on the bank of the gulf of Adramyttium.

CORYPHASIUM, a promontory on the western coast of the Peloponnesus, in Messenia, and near the isle of Prote, according to Pausanias. It is now "Cape Zonchio."—Also, a town of Messenia, to the west, on the above-mentioned promontory, S. E. of the island of Asina. The inhabitants of Pyla retired hither after the destruction of their town; and hence Thucydides says, that Pyla was called Coryphasium by the Lacedæmonians.—Also, a town of the Peloponnesus, in the Argolide, according to Pliny. It was situated on the coast, between the isthmus of Corinth and the promontory Scyllæum.

CORYPHE, in *Medical Writers*, is used for the crown of the head; as also for the interior extremity of the fingers next the nails.

CORYS, in *Ancient Geography*, a river of Arabia, which discharges itself into the Erythraean sea.

CORYSTION, in *Ichthyology*, a name given by Klein to the yellow gurnard or *CALLIONYMUS Lyra*. See **LYRA**.—Also, a name given by the same author to the *TRACHINUS Draco*, or wever.—Also, to the *COTTUS grunicus* and *scorpius*; and to the *TRIGLA gurnardus*, *cuculus*, and *hirundo*.

CORYTHENSES, in *Ancient Geography*, a people of the Peloponnesus, in Arcadia.

CORYVREKAN, in *Geography*, a gulf or bay between the island of Jura and Scarba, on the western coast of Scotland; with a dangerous whirlpool.

CORYZA, in *Medicine*, is that form of defluxion, or catarrh, which is confined to the membranes lining the nostrils, and passages to the throat. It is commonly called a *cold in the head*. The symptoms of coryza have been already detailed under the head of **CATARRH**, as well as the cause and method of treatment. See that article.

COS, **Coos**, or **Cous**, in *Ancient Geography*, one of the Sporades, is reckoned by Pliny among the most considerable islands of the Ægean, or rather Myrtoan sea. It was formerly known by the names of Merope, Cea, Nymphæa and Caris; and is now called by the Greeks *Cos*, by others Lango, and by the European navigators Stancho, or Stancho. It was situated at a small distance from the coast of Caria, E. of the town of Cnidus on the continent S. E. of the island of Nisyros, to which, as Strabo says, it was once joined, and N. E. of that of Calymna, and 15 miles from Halicarnassus. Strabo assigns to it a circuit of about 550 stadia or about 75 miles, and Pliny

makes it 100 miles. By modern measure, it is about 24 miles long, and 3 or 4 broad. The chief city of this island was first called *Astypalæa*, and afterwards *Cos*. Strabo mentions a stately temple erected by the Coans in honour of *Æsculapius*, the tutelary god of their island, and enriched with offerings and presents of great value; but the chief ornament of the place was a *Venus* rising out of the sea, done by *Apelles*, and deemed one of his best performances. This admirable piece of sculpture was conveyed by *Augustus* to Rome, and dedicated to *Cæsar*; *Venus* being reckoned the mother of the *Julian* family. In consideration of this loss, the Coans were eased by *Augustus* of a considerable part of their annual tribute. This island was famous for a kind of fine stuff, much valued by women of distinction at Rome; for it covered them, as *Vellerius Paterculus* says, and yet shewed them naked; and hence it has been so much inveighed against by the Latin poets. This island has been rendered singularly famous by the number of illustrious persons which it has produced. Among these, we may reckon *Hippocrates*, *Senius*, another celebrated physician, *Ariston*, a Peripatetic philosopher, and *Apelles*, the celebrated painter. To these we may add, *Siphus*, who is said to have been secretary to *Teucer*, and to have possessed the records of the Trojan war, used by *Homer*. Before the Trojan war, this island was inhabited by Greeks, a colony of *Dorians*, from the continent. The government was at first monarchical; as history mentions among its kings *Eurypylos*, contemporary with *Hercules*, *Antiphus*, and *Phidippus*, the two latter of whom are said by *Homer* and *Theocritus* to have assisted at the siege of *Troy*. The king-ly government was succeeded by democracy; and this, as *Aristotle* informs us, by an aristocracy, which was abolished by some private persons, who, assuming the whole power to themselves, governed with an absolute sway. *Hippocrates* says, that the Coans refused to succour the messengers of *Darius* and *Xerxes*; but *Herodotus* numbers the Coans among the Greeks, who served as auxiliaries in the army of *Xerxes*. In the 20th year of the Peloponnesian war, the city of *Cos* was demolished by an earthquake; and soon after this calamity, *Astyoehus*, the Lacedæmonian, invaded the island, laid waste the whole country, plundered the city, the inhabitants having fled to the mountains, and then retired to *Cnidus* with an immense booty. When *Mithridates* commanded all the Romans in Asia to be massacred, the island of *Cos* afforded them an asylum. However, *Mithridates* soon after invaded the island, took the metropolis, and ravaged its territory. The Coans, provoked by this outrage, as soon as they saw *Lucullus*, *Sylla's* questor, off their coast, took up arms, expelled the king's garrison, and admitted the Romans, by whom they were amply recompensed. The Coans remained ever faithful to the Romans, and highly contributed to several victories gained by their fleets. Nevertheless, in the reign of the emperor *Claudius*, they, like the other Greek states, paid an annual tribute to Rome, which this emperor remitted, in compliance with the request of *Xenophon*, his physician. This immunity they enjoyed till the reign of *Vespasian*, who, reducing them to a Roman province, exacted the same tribute from them as from the other Asiatic islands. The soil of this island is fertile, and produces a great variety of fruit: it is now covered with groves of lemon trees, and it has an oriental plane tree of very large size. Its chief trade is in oranges and lemons: from this island was first derived the name and substance of the whetstone: and *Cos* is the residence of a Turkish pacha. The knights of *Rhodes* found in this island a small city or town, near the sea, at the bottom of a large bay, and at the foot of a high

mountain. The haven was then commodious and wide; but its mouth has been so choaked with the sand thrown into it by the waves, that none but small vessels can put into it, while those of a larger bulk are obliged to ride in the road near it, where they have a good bottom and anchorage. On this island the great master caused a strong castle to be built, and then left it under the government of one of the knights, who laid the foundation of commerce in the island: and this gradually became so considerable, that the town flourished, and was regarded as a second *Rhodes*; so that it was raised to the dignity of a bishop's see under that of *Rhodes*, and erected into one of the bailiwicks of the order. For a further account of its present state, see *STANCHIO*.

Cos, a town of Egypt, *Steph. Byz.*—Also, an isle of Egypt, over against the town of *Cynopolis*. *Ptolemy*.

Cos, whetstone, in *Natural History*, a genus of sand-stones, consisting of fragments of an indeterminate figure, sub-opaque, and granulated. There are several species of this genus, which are used for mill-stones, &c. See *SAND-STONES* and *WHESTONE*.

COSA, or *Cossa*, in *Ancient Geography*, a town situated on a small isthmus, which joined the ancient mountain *Argentarius*, mount *Argentato*, in which place *Jupiter* was worshipped. *Rutilius*, in his *Itinerary*, says, that it was desolated by rats, and on this account was abandoned by its inhabitants. Its port, situated to the south, was called "Portus Herculis," posto *Ercole*. This town was municipal and a Roman colony: it was treacherously surrendered to *Hannibal*. During the troubles in the time of *Sylla*, it was besieged and taken by that general.

Cosa, or *Kofa*, in *Geography* a river of Asia, equal to the *Rhine*, which rises in the mountains of *Thibet*, and which once ran by *Purneah*, and joined the *Ganges* opposite to *Rajemal*; but its junction is now 45 miles higher up; almost opposite to *Bogipour*.

COSACKS. See *COSSACKS*.

COSALE, a town of *Naples*, in the province of *Abruzzo Citra*; 6 miles S. E. of *Civita Borella*.

COSAMBA, in *Ancient Geography*, a town of *India*, on this side of the mouths of the *Ganges*. *Ptol*.

COSARIA, in *Botany*, *Forsk.* See *DORSTENIA radiata*.

COSCEZ, in *British Antiquity*, a distinctive appellation given to a class of persons, who were original holders of manors, and contradistinguished from *Bordarii*, who were holders of land by particular services, and who furnished the master with poultry, eggs, &c.; *Coliberti*, who were a band of freedmen, of a particular class, and were made free by one and the same master; and *Villani*, the originals of our present copy-holders, who held their lands by performing the services of husbandry on their lord's demesne, which were, in aftertimes, commuted for what is now called a *quit-rent*; and *Cotarii*, who held by a free socage tenure, and were afterwards known by the title of "Sockmen," a kind of farmers, who provided wheat for their respective lords. Some of our antiquaries have considered *Cofcez* and *Cotarii*, as synonymous terms; and have classed them under one and the same denomination of cottagers. But they were evidently distinct, and erroneously classed under the simple name of cottager. The *Cofcez*, as distinguished from the *Cotarii*, or as they are sometimes called *Coches*, i. e. *Couches*, from the French verb *coucher*, were obliged to furnish the lord and his retinue with lodging, whenever they might chuse to demand it. This particular privilege of the lords of manors is, in the feudal law, pointed out by the term

term *Cosbering*, (i. e. *couchering, couchant*, Fr.) The word *Cofeez*, or *Cofhes*, was, therefore, apparently, chosen to distinguish such people from the tenants, who were merely required to furnish provisions for the use of the lord.

COSCINIA, in *Ancient Geography*, a village of Asia Minor, situated on the side of the Meander, according to Strabo. Pliny calls it *Cofcinus*, and places it in Caria.

COSCINOMANCY, the art of divination, by means of a sieve.

The word comes from *κοσκινον, cribrum, a sieve*, and *μνστεια, divination*.

The sieve being suspended, after rehearsing a formula of words, is taken between two fingers only; and the names of the parties suspected, repeated: he at whose name the sieve turns, trembles, or shakes, is reputed guilty of the evil in question.

This must be a very ancient practice: Theocritus, in his third Idyllion, mentions a woman very skilful in it. It was sometimes also practised by suspending the sieve by a thread, or fixing it to the points of a pair of sheers, giving it room to turn, and naming, as before, the parties suspected: in which last manner, *coscinomancy* is still practised in some parts of England. It appears from Theocritus, that it was not only used to find out persons unknown, but also to discover the secrets of those that were known.

COSCOROBA, in *Ornithology*, a species of ANAS, with the end of the beak dilated and rounded, and a white body. Its beak and legs are red, and its eyes very black. It is found in Chili.

COSCYLIUM, in *Natural History*, a name given by some of the old writers to the kermes, the true nature of which they did not know, but supposed it to be a sort of scabrous excrescence, formed of the abundant juices of the tree, and of the nature of the galls on the oak, and other trees.

CO-SECANT, in *Geometry*, the secant of an arc, which arc is the complement of another arc to ninety degrees.

COSEDIA, in *Ancient Geography*, a town of Gaul, in Lyonnensis Secunda; placed by d'Anville on the sea-coast, N. of Constantia.

COSEL, in *Geography*, a town of Prussia, in Upper Silesia, situated in the principality of Oppeln, not far from the Oder. After the great Frederic had wrested Silesia from the house of Austria, Cosel was strongly fortified; yet, in 1745, the Austrians took it by storm, but were soon driven again from the place by the Prussians. In the year 1758, Cosel was for a long time blockaded by the Austrians, and in the short war of 1806 and 1807, it was one of the few Prussian fortresses, which were ably defended against the French and their allies. Colonel Neumann, who commanded in the place, was raised to the rank of major-general, but died soon after his promotion. A few months after the peace of Tilsit, the king of Prussia publicly expressed his satisfaction at the gallant conduct of the garrison of Cosel by sending the Order of the Red Eagle to prince Biron of Courland, and the order *pour le merite* to captains Caspini, Woltrowsky, and Lehman.

COSEL, or *Coeslef*, is also a small town of Denmark, in the duchy of Slefwick.

COSENAGE, or COSINAGE, in *Law*, a writ that lies where the trespas, that is, the trespas, the father of the trespass, or great grandfather, being seized in fee at his death of certain lands or tenements, dies; a stranger enters and abates; then shall his heir have this writ of *cosenage*; the form of which see in Fitzh. Nat. Bro. fol. 221. See ASSISE de Mort d'Ancestor.

COSENING, an offence whereby any thing is done deceitfully, in, or out of, contracts, which cannot be fitly termed by any especial name. In the civil law, it is called *stellionatus*. See STELLIONATE.

COSENZA, in *Geography*, a city of Naples, the capital of Calabria Citra, pleasantly situated, about 12 miles from the Mediterranean sea, at the southern extremity of a spacious plain, which, with a considerable breadth, extends above 20 miles down the course of the river Crati. The city, now the see of an archbishop, and residence of the governor of the province, stands upon seven hills, which form part of its armorial coat. The metropolitan church is the only church within the walls; but in the faubourgs there are three parish churches; and there are twelve convents. The environs are beautiful, populous, and well cultivated, producing abundance of corn, fruit, wine, oil, and silk. From the situation of the low grounds, which are very fertile, and from frequent waterings, they exhale vapours in summer that constitute a "Mal Aria," very productive of fevers. Cosenza was anciently the capital of the Brutian state, and of some consequence during the second Punic war. In the tenth century it was reduced to ashes by the Saracens, but by the munificence of its prelates it soon recovered from the calamity. The attachment of the natives to the Angevine family, the descendants of Lewis III. of Anjou, who died here in 1434, and to the French cause, excited the vengeance of the Arragonian party, who committed shocking outrages at Cosenza in the year 1457. Earthquakes have been very destructive in this place. The number of its inhabitants has been variously stated to amount to 18,000; but from Mr. Swinburne's information, it does not much exceed 9,000. It is distant 145 miles S. E. of Naples. N. lat. 39° 22'. E. long. 16° 22'.

COSETANI, in *Ancient Geography*, a people of Spain, S. E. of the Lacetani. Their principal town was Tarraco.

COSEUS, in *Geography*, a town of Asiatic Turkey, in the Arabian Irak; 80 miles S. of Bagdat.

COSH, in *Agriculture*, is a term signifying the same as pod, or the capsule which contains the seed in many sorts of plants, especially those of the leguminous kind. See Pod.

COSHERING, in the *Feudal Customs*, a kind of right of the lords to lie, and, as some say, feast themselves, and their followers, at their tenants houses. See COSEZ.

COSHERING, in the history of Ireland, means visitations and progresses made by the lord and his followers among his tenants, which were very grievous to the latter, and with other exactions made the lord an absolute tyrant, and the tenant a very slave. Ledwich.

COSIA DI DONNA, in *Geography*, a small island near the west coast of Sardinia; 6 leagues W. S. W. of Bosa.

COSILAUS, in *Ancient Geography*, a village of Palestine, not far from the town of Chalcedon; called Colæus by Sozomen.

COSILINUM, a place of Italy, in Lucania, forming a part of Magna Græcia. It was situated towards the N. W. and separated from Campa by the mountains.

COSIMO, PIETRO DA, in *Biography*, a painter, born at Florence, in the year 1441. He was the scholar of Cosimo Rosselli, whom he attended to Rome, where, by the advances he made in his profession, he acquired the favour of the pope, and was employed some years in the Vatican. He painted both history and portrait. His colouring is good, but though his figures have much spirit, his design was not always correct, and though highly spoken of by Vasari, his celebrity is perhaps principally owing to his

having been the master of Andrea del Sarto. Amongst his small pictures, which are his best performances, the story of Perseus in the gallery of Florence is worthy of notice. Towards the close of his life he amused himself by painting monsters, such as harpies, satyrs, &c. and died in 1521. Vafari. Lanzi. Stor. Pittor.

COSIN, JOHN, was born at Norwich, of respectable parents, in 1594. Here he received an excellent grammatical education; and at an early age was admitted at Caius college, Cambridge, where he took his degree in Arts, and was appointed Fellow. Before he was twenty years of age he was made secretary to the bishop of Litchfield and Coventry, and, in 1619, he was appointed domestic chaplain to Dr. Neile, bishop of Durham, who eventually conferred upon him a prebend: which was but preparatory to additional rank and honour in the church. He was the friend of Laud, and was supposed to have a strong tendency to the doctrines and discipline of popery. "A Collection of private Devotions," published by Mr. Cofin in the year 1627, led many persons to suspect, that he had no particular partiality for the church, of which he was a member, and this suspicion was strengthened by the part which he took in the prosecution of Mr. Peter Smart for his discourse preached against the advances towards popery. This was in the year 1628, about which period he took his degree as doctor in divinity. In 1634, he was elected master of Peter-house, and, in 1640, were delegated to him the high offices of vice-chancellor of the university; dean of Peterborough, and chaplain to the king. He had now attained to great rank, but probably not to the acme of his wishes, when a reverse of fortune was reserved for him. The prosecution of Smart was not forgotten, and upon a petition complaining of Dr. Cofin's superstitious and innovations in the church of Durham, the house of commons not only sequestered all his benefices, but preferred against him, before the upper house, an impeachment, containing twenty-one articles. Of these charges he vindicated himself and was acquitted; but, as in other cases of a similar nature, the prosecutors never thought of making him any compensation for the various injuries which he had sustained by imprisonment and loss of property. The spirit of Dr. Cofin was however unbroken, and, in 1642, he was concerned with others in sending the plate, belonging to the university of Cambridge, to king Charles, who was then at York. For this he was by parliament declared incapable of holding any ecclesiastical preferments, and lost his situation as master of Peter-house. Fearing that the resentment of the government might be carried still farther, he left the kingdom and sought for safety in Paris. Here, when reduced to considerable difficulties, he exhibited a strict regard for the protestant religion, and rejected certain handsome offers which were made to him, to unite with the Catholics of that country. He formed a congregation of English exiles, in which he kept up the English church discipline, and the form of worship appointed in the Common Prayer. On the restoration of Charles II., Dr. Cofin returned to his native country, where he was reinstated in his former preferments; and as a reward for his tried attachment to royalty, he was, in the year 1660, elevated to the rich see of Durham. After this he took little if any share in the politics of the day, and was distinguished for his moderation and benevolence. He died in the year 1671 2 of the dropsy in the chest, having entered his seventy-eighth year. He had written many books chiefly on controversial points of theology, the enumeration of which would not interest our readers. His character for integrity and independence was fully established as well by active zeal, as by

a readiness to suffer in defence of the cause which he had espoused. Biog. Brit.

CO-SINE, in *Geometry*, is the right *sine* of an arch, which is the complement of another to 90 degrees.

COSINISSA, in *Geography*, a small island in the Grecian Archipelago. N. lat. 36° 36'. E. long. 25° 42'.

COSINTUM, in *Ancient Geography*, a town of Thrace between Topiris and Pyrsolis, according to the Itinerary of Antonine.

COSLI, in *Geography*, a town of European Turkey, in the province of Bulgaria; 52 miles S.S.E. of Silitria.

COSLIACO, a town of Austrian Iltria; 12 miles W. of St. Veit.

COSLIN. See **COSSLIN**.

COSMAS, in *Biography*, an Egyptian merchant, who, under the emperor Justinian, in the course of his traffic, made some voyages to India, about the year 522, whence he acquired the surname of "Indicopleustes," or the Indian navigator; but afterwards, by a transition not uncommon in that superstitious age, renounced all the concerns of this life, and assumed the monastic character, as it is said, among the Nestorians. In the solitude and leisure of a cell, he composed several works, between the years 535 and 547; one of which, dignified by him with the name of "Christian Topography" has reached us. This book was published at Alexandria, A. D. 547; and some curious extracts of it may be found in Photius (Cod. xxxvi. p. 9, 10. edit. Heeschel), Thevenot in the 1st part of his "Relations des Voyages, &c." and Fabricius (Bib. Græc. l. iii. c. 25. tom. ii. p. 617). The entire work has been published by father Montfaucon at Paris, A. D. 1707, in the "Nova Collectio Patrum" (tom. ii. p. 113—344). The main design of this work is to combat the opinion of those philosophers, who assert that the earth is of a spherical figure, and to prove that it is an oblong plane, 12,000 miles in length from east to west, and 6000 miles in breadth from north to south, surrounded by high walls, covered by the firmament as with a canopy or vault:—that the vicissitude of day and night was occasioned by a mountain of prodigious height, situated in the extremities of the north, round which the sun moved:—that when it appeared on one side of this mountain, the earth was illuminated; when concealed on the other side, the earth was left involved in darkness. However, amidst these wild reveries, more suited to the credulity of his new profession, than to the sound sense characteristic of that in which he was formerly engaged, Cosmas seems to relate what he himself had observed in his travels, or what he had learned from others, with great simplicity and regard for truth. He appears to have been well acquainted with the west coast of the Indian peninsula, and names several places situated upon it: he describes it as the chief seat of the pepper trade, and mentions Mala, probably the origin of Malabar, as one of the most frequented parts on that account. From him also we learn, that the island of Taprobane, which he supposes to be at an equal distance from the Persian gulf on the west, and the country of the Sinæ on the east, had become, on account of this commodious situation, a great staple of trade; that into it were exported the silk of the Sinæ, and the precious spices of the Eastern countries, which were conveyed thence to all the parts of India, to Persia, and to the Arabian gulf. To this island he gives the name of Sieldiba, nearly the same with that of Selandib, or Serendeb, by which it is still known over the East. To Cosmas we are also indebted for the first information of a new rival to the Romans in trade having appeared in the Indian seas. All the considerable ports of India were frequented by traders from Persia, who, in return for some productions

productions of their own country in request among the Indians, received the precious commodities, which they conveyed up the Persian gulf, and by means of the great rivers, Euphrates and Tigris, distributed them through every province of their empire. As the voyage from Persia to India was much shorter than that from Egypt, and attended with less expence and danger, the intercourse between the two countries increased rapidly. Cosmas mentions a circumstance, which is a striking proof of this fact. In most of the cities of any note in India he found Christian churches established, in which the functions of religion were performed by priests ordained by the archbishop of Selencia, the capital of the Persian empire, and who continued subject to his jurisdiction. Accordingly we learn from this traveller, that Christianity was successfully preached to the Bactrians, the Huns, the Persians, the Indians, the Parthians, the Medes, and the Elamites. The coast of Malabar, and the isles of the ocean, Socotora and Ceylon, were peopled with an increasing multitude of Christians. It is remarkable, however, that, according to the account of Cosmas, none of these strangers were accustomed to visit the eastern regions of Asia, but rested satisfied with receiving their silk, their spices, and other valuable productions, as they were imported into Ceylon, and conveyed thence to the various marts of India. Cosmas published also "A Cosmography of the southern parts of Africa, &c." "Astronomical Tables," and "A Commentary on the Song of Songs." Robertson's Historical Disquisition concerning Anc. India, sect. 2. Gibbon's Hist. of the Rom. Emp., vol. vii. and viii.

COSME, or COME, FRERE JEAN DE ST., a monk of the order of the Feuillans, in Paris, famous for his skill in lithotomy, was educated to the practice of surgery; but losing his father, under whom he had been instructed, at an early age, he retired from the world, and became a monk. Here, however, he continued improving himself in the art to which he had been bred, giving his assistance to all who applied, without receiving any compensation, but the thanks of the persons he relieved. The instrument with which he performed the operation for extracting stones from the urinary bladder, he called *lithotome caché*, a hollow tube, in which was concealed a knife, with which he cut through the prostate gland, into the bladder. His care was to make the wound sufficiently large, to enable him to extract the stone easily, and without bruising the parts. To this, it is probable, his success, far superior to any of his rivals, must be attributed. The fame he acquired drew upon him the envy of the surgeons of Paris so far, that they are said to have applied to the king to interdict his practising. Not succeeding in this attempt, Monf. Le Cat published "Lettre au Sujet du Lithotome Caché, &c. contra F. Cosme Differt.," 1749. Cosme's dissertation, describing the operation, had been published the preceding year, in the "Journal des Savans." This produced an answer from De Cosme, under the title of "Recueil des Pièces importantes sur l'Operation de la Taille," Paris, 1751; in which he acknowledges some failures of success, and that he had lost one patient by hæmorrhage; but challenges his adversaries to produce lists of successful cases equal to his, which, it seems, they were not able to do. That his success was rather owing to his adroit manner of performing the operation, than to the excellence of his instrument, is more than probable, as on his death the instrument soon fell into disuse. He has the credit of having made some improvement on the operation for extracting, instead of depressing or couching, cataracts. For the titles of the several rejoinders, explications, &c. of Le Cosme and his opponents, see Haller's Bib. Chirurg. One of Le Cosme's controversial pieces is dated 1763,

which, as he was born in 1703, shews that his life was protracted to sixty years; how much farther we have no opportunity of knowing.

COSMEA, in *Botany*, Willd. 1537. (Cosmos; Cav. Ic. 1. 9.) Class and order, *syngenesia polygamia frustranea*.

Gen. Ch. *Common calyx* double, both one-leaved, eight-cleft, permanent. *Receptacle* chaffy. *Florets* of the disc numerous, tubular, hermaphrodite; of the ray ligulate, three-toothed, female, barren. *Seeds* tetragonous, crowned with three or four recurved awns.

It differs from *coreopsis* in the structure of the calyx.

Sp. 1. *C. sulphurea*. Willd. 1. (Cosmos sulphureus; Cav. 1. 56. tab. 79. *Coreopsis artemisiæ folio*; Jacq. Ic. 3. tab. 595.) "Leaves bipinnatifid; segments lanceolate; segments of the outer calyx lanceolate." *Root* annual. 2. *C. bipinnata*. Willd. 2. (Cosmos bipinnatus; Cav. 1. 10. tab. 14.) "Leaves bipinnated; leaflets linear-awl-shaped; segments of the outer calyx egg-shaped." *Root* perennial. *Stem* three or four feet high, cylindrical, branched near the top. *Flowers* large, with a yellow disk, and deep purple or dark rose-coloured ray, solitary, axillary, and terminal, on long peduncles. 3. *C. parviflora*. Willd. 3. (*Coreopsis parviflora*; Jacq. Hort. Schoenb. 3. 65. tab. 374.) "Leaves bipinnated; leaflets filiform; segments of the outer calyx lanceolate." *Root* annual. *Outer calyx* longer than the inner. *Ray* of the flowers white. All the three species are natives of Mexico. Willdenow asserts that the florets of the ray in the first species are fertile.

COSMETIC, from *κοσμεω*, to adorn, a term in *Physic*, used for any medicine, preparation, or means, employed to beautify and embellish the face, and preserve or improve the complexion; as cerufs, and the whole tribe of fucufes, washes, cold creams, lip-salves, &c. See WATER.

The Indians use the water of green cacao-nuts as a grand cosmetic, which wonderfully improves their complexion.

COSMI, in *Ancient History*, magistrates of Crete, during the period of its republican government, next in authority to the senate, and so called from the Greek word *cosmos*, signifying order; these magistrates being appointed for the maintaining of good order in the state. Their power was much the same with that of the ephori at Sparta: they were ten in number, and, like the ephori, chosen out of the body of the people; the meanest of the populace having an equal right to this dignity with the most illustrious families of the republic. They were intended as the balance between the people and the senate, and a check upon both; for, without their approbation, no decree was of any validity. Out of their body the senators were chosen; none being admitted to that office who had not before given some proofs of their prudence, equity, and disinterestedness, in the college of the cosmi. In time of war, they commanded the armies of the republic with absolute power, but were afterwards liable to be called to an account; whereas the senators were not accountable for their administration. See CRETE.

COSMICAL, something that refers, or has a relation to the world; in Greek *κοσμος*.

COSMICAL *Aspect*, among *Astrologers*, is the aspect of a planet with respect to our earth. See ASPECT.

COSMICAL *Qualities* are used by Mr. Boyle in the same sense with syllematical ones.

Though, in considering the qualities of natural bodies, we usually only take in the powers any particular one has of acting on, or its capacity of suffering from the action of another, wherewith it is observed to have some manifest commerce, by a communication of impressions; yet there may be

be several alterations to which it may be liable, not barely on account of those qualities presumed to be evidently inherent in it, nor of the respect it bears to those other particular bodies, whereto it seems manifestly related; there may be many unheeded agents, which by unperceived means have great operations on the body we consider, and work such changes in it, as are not otherwise to be accounted for. And these are what Mr. Boyle calls *cosmical*, or *systematical qualities*.

To account for these cosmical qualities, the same author proposes some cosmical suspensions, as to some unobserved laws and orders of nature; and refers them principally to the action of certain effluvia hitherto unobserved.

COSMICAL is also used, in *Astronomy*, to express one of the poetical risings of a star.

A star is said to rise cosmically, when it rises together with the sun; or with that degree of the ecliptic wherein the sun then abides.

Cosmical setting is, when a star sets and goes down in the west, at the same time the sun rises in the east.

To ascend above, or descend below, the horizon.

COSMIN, or KOSMIN, in *Geography*, a town of Poland, in the palatinate of Kalisch; 16 miles S.W. of Kalisch.

COSMO I. in *Biography*, grand duke of Tuscany, son of John de Medici, was born in 1519. On the assassination of Alexander, he took such measures as caused himself to be unanimously elected chief of the republic. A party, headed by some persons of high rank, was formed against him, but Cosmo was supported by the power of Charles V. and firmly fixed on his throne. To strengthen his hands he married Eleanora de Toledo, daughter of the viceroy of Naples. In 1553 the Siennese revolted from the emperor: the malcontents were assisted by France, but Cosmo joined the imperialists, and triumphed over all opposition. Sienna surrendered to his power, and with the adjoining district was annexed to the Florentine dominions. He instituted the military order of the knights of St. Stephen for the defence of the coast, and allotted to them a palace at Pisa. Conspiracies were formed against him by the high spirited Florentines, but he rendered himself superior in every struggle for power; in his own family, however, he was one of the most unfortunate of sovereigns. He had a numerous offspring, but the fate of his two sons John and Garcia was truly tragical, the elder, John, at the age of 17, was raised to the dignity of cardinal: Garcia then but 15, jealous, probably, of the high honours conferred on his brother, and possessing a cruel and malignant disposition, took an opportunity, while on a hunting party, to stab him to the heart; after which he joined the rest of the company with an air of perfect tranquillity. The dead body was soon discovered, and the death of the youth was ordered by the duke to be attributed to apoplexy. He was, however, too wary to be deceived himself, well knowing by whom the bloody deed was done: and sending for Garcia charged him with the crime, which, though at first, he denied in the most peremptory manner, he at length confessed. The unhappy father, armed with arbitrary power, commanded his son to prepare for the punishment which he deserved, and, almost at the same instant, snatching Garcia's dagger, the instrument of his guilt, he plunged it into the criminal's bosom, and laid him dead by the corpse of his brother. Their mother survived the loss of her sons a few days only. Cosmo enjoyed the supreme power during a period of 38 years, and died in 1574, aged 55. The magnificence of his disposition, which has been greatly and justly cele-

brated, shewed that he merited the crown which he wore. He is signalized as an encourager of letters and the fine arts. He restored the university of Pisa, invited to it professors of the first talents, and founded in it a new college for the education of forty students. Cosmo was the founder of the Florentine academy: made great additions to the Laurentian library, and laid the foundation of the famous gallery of Florence, at the same time furnishing it with the relics of antiquity, and the most precious works of art. By the encouragement which he offered, the most celebrated artists in every line crowded to his capital: here they were sure of employment, and of rewards proportioned to their merit. He engaged the ablest printers in the publications of important works. He promoted the sciences of astronomy and navigation; and encouraged the arts of agriculture and medicine, which began to be studied on general principles; and at Florence and Pisa he laid out botanical gardens, and expended large sums in the prosecution of his plans. His own time was spent in the most useful and liberal studies, for which he had a great taste. In consideration of his munificence as a prince and patron of learning and learned men, he was, in 1569, created by pope Pius V. "Grand duke of Tuscany," a title which he conferred with his own hands. To this innovation several of the powers of Europe objected at first, though, in a short time, they all acquiesced in it; and the honour descended to the successors of Cosmo, in common with their other titles.

COSMO II. son of Ferdinand I. and grandson to the preceding, succeeded to the dukedom in 1609, and rendered himself illustrious by the equity and mildness of his government, and by his zeal in the promotion of literature and the fine arts. He was a capital economist, but without the liability of being charged with selfishness or avarice, and so well did he manage the public money, that in 1617 he was able to send an army of 20,000 men to the assistance of the duke of Mantua against Savoy, without laying a single tax upon his subjects. He died in 1621.

COSMO III., born in 1642, was son of Ferdinand II., whom he succeeded in 1670, and inclining to the house of Austria in opposition to that of France, he obtained from the emperor the title of Royal Highness, which was confirmed by the pope, and, after some opposition, admitted by the other powers. In the year 1700 he went to Rome, and at the jubilee he expressed a vehement desire to touch the holy handkerchief, an indulgence which the pope refused to grant to any one who was not a canon of St. Peter's. Cosmo without hesitation entered into priest's orders, obtained a canonry, and then was allowed what he so anxiously desired, together with the privilege of bestowing his benediction upon the surrounding crowd. His part of his conduct has subjected him to reproaches either as a hypocrite, or a weak devotee. His religion did not prevent him from attending to his temporal rights: but by strict economy and the taxes which he imposed on his people he was one of the richest princes of Europe. His liberality was by no means proportioned to his wealth; and after a long reign he died in 1723, having attained to the great age of 81 years. He was devoted to the chemistry of the day, and is said to have been pleased when his friends requested medicines made up at his own laboratory. Univer. Hist. Moreri.

Cosmo. See COSMAS.

COSMOGONY, in *Physics*, signifies the science of the formation of the universe. The term is formed of *κοσμος*, the world, and *γονη*, I am born. It differs from *cosmography*, which is the science of the parts of the universe, supposing it formed, and in the state in which we behold it; and from *cosmology*, which reasons on the actual and permanent state

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of the world formed as it now is; whereas *cosmogony* reasons on the variable state of the world at the time of its formation. In our conjectures about the formation of the world there are two principles which we ought never to lose sight of. 1. That of *creation*; for certainly matter could not give itself existence, it must have received it. (See CREATION.) 2. That of a supreme intelligence directing this creation, and the arrangement of the parts of matter, in consequence of which this world was formed.

Various opinions have been held both by the ancients and moderns concerning the origin of the universe, and the time as well as the manner of its formation. Although a brief abstract of these opinions will be found under the appropriate titles or appellations of those by whom they were maintained, we shall in the sequel of this article give a connected summary of them, together with references to those heads or titles under which the particular detail of them occurs. These opinions may be comprehended under the three following distinctions; *viz.* 1. That the world is eternal, both as to matter and form: 2. That the matter of the world is eternal, but not the form: 3. That the world had a beginning, and will undergo a dissolution: being in its own nature perishable.

Ocellus Lucanus, whose antiquity and authority have been contrasted against those of Moses, though he lived in the age preceding that of Plato, was one of the most ancient assertors of the eternity of the world. In a book which he wrote "On the Universe," and which is still extant, he affirmed, that the universe never had a beginning, and never will have an end, being incapable of generation or of corruption; that of itself it is eternal, perfect, and permanent for ever, and that the frame and parts of the world, as well as the substance and matter of the whole, and also mankind, must necessarily be eternal. His arguments for this opinion are either very absurd and ridiculous, as when he attempts to prove, that the world must be eternal, because its figure and motion are both circular, and therefore without beginning or end; or else they are such as tend to prove, that something must be eternal, because it is impossible for every thing to originate from nothing, or to fall into nothing, alleging that since there is nothing exterior to the universe, it is a contradiction to ascribe to it a beginning, because it must have been produced by some other thing, and then it is not the universe. He himself however seems to be persuaded that the necessity of existence must flow from an eternal and intelligent mind, the necessary perfections of whose nature are the cause of that harmony which subsists in the universe, and which prevents its disarrangement. He allows, that God has given to man faculties, organs of sense, and appetites, not for the sake of pleasure, but for final causes; and expressly asserts, that the ever-active being governs, and that the ever passive is governed; that the one is first in power, the other posterior: that the one is divine, rational, and intelligent, the other generated, irrational, and liable to change. See OCELLUS LUCANUS. Aristotle, who seems to have freely borrowed from the above work in his treatise "On Generation and Corruption," held the same opinion with regard to the universe; and he was the first, at least among the Greeks, who asserted it; for he says, (De Cælo. l. i. c. 10.) that, before his time, the temporary production of the world was a tenet universally received, though it was a question whether it should ever perish or not. It was his doctrine, that not only the matter of the heavens and the earth was ungenerated and eternal; but that even mankind, and all the species of animals, male and female, have subsisted from everlasting to everlasting by a perpetual course of genera-

tion, without any original beginning or production; or that the earth has for ever been adorned with trees, plants, flowers, animals, and other productions as we now observe it. The great reason, which induced Aristotle to assert the eternity of the world, was his conceiving, that such an effect must of necessity eternally proceed from such an eternal cause as the divine mind, which, being altogether act and energy, could not rest in a state of inactivity. He acknowledged, however, (Metaph. l. i. c. 2, 3) that a spiritual substance is the cause of the universe, and the source of all the order and beauty, as well as of the motions and forms which we so much admire. And he expressly describes God to be an intelligent being (NBS;) incorporeal, the first mover of all things, himself immovable, eternal, indivisible, and destitute of all quantity; and he asserts, that if there were nothing but matter in the world, there would be no original cause, but an infinite progression of causes, which is evidently absurd. However we may infer the true notion of this great philosopher to have been, that though the world had no temporary generation, yet it was produced from one Supreme Deity, after some other manner. (See ARISTOTLE.) Although Plato himself acknowledged that the world was made by God, yet he used some expressions which intimated that the time of its formation was indefinite; such as when he says, that the world must be an eternal resemblance of the eternal idea; so that many of his followers, adhering to Aristotle's opinion, availed themselves of these expressions, and explained them as denoting, that by the creation of the world was not to be understood a creation in time, but only in order of nature, causality, and dependance; the will of God, and his power of acting, they say, being necessarily as eternal as his essence, the effort of that will and power must be supposed coeval with the will and power themselves. According to these philosophers, existence from eternity, and being caused or produced by another, were not apprehended to be contradictory or inconsistent. And as they were led into this opinion, from the sole consideration of the benevolent will and generative power of the Deity, they allowed that the world, notwithstanding its existence from eternity, might in some sense be said to be made, as being produced from another cause, and not self-originated. To this purpose, Proclus himself, the grand champion for the world's eternity, plainly acknowledges, that the generation of the inferior gods and of the world must be so understood; meaning, when they called it the generation of the gods, not any temporary production, but their ineffable procession from a superior first cause (Procl. in Tim. p. 85. Cudworth. p. 253.) The later Platonists, being fond of this notion of the eternity of the world, endeavoured, by forced constructions, to wrest their master's words, especially his "Timæus," to their own purpose. Accordingly this doctrine of the world's co-eternity with God was, in the 6th century, allowed to be publicly taught in Alexandria, by Ammonius the scholar of Proclus, and not without success. (See PLATO and PLATONISTS.)

Some modern assertors of the eternity of the world have ventured to affirm the material universe to be self-existent, and to be the supreme deity himself. This is the doctrine of Spinoza, the first, as it is supposed, who reduced Atheism into a system, by regular deductions, after the method of the mathematicians. (See SPINOZA.) However the fundamental opinion, on which Spinoza erected his system, was not new; but others long before his time had led the way, though in some respects he departed from them. The opinion that the universe is one substance, and that God and
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the world are one and the same thing, is supposed to have been first taught by Xenophanes, the founder of the sect afterwards called the Eleatic. He is said to have held not only the eternity and immutability of the world; but also, that whatever existed was one being; that there was neither any generation nor corruption; that this one being was immovable, and remained always the same, and was the true God. This doctrine was not only defended by his successors, Parmenides, Melissus, and Zeno of Elea, but by Sphilpo, and the Megaric philosophers also. (See the articles XENOPHANES, PARMENIDES, ZENO, and STILPO.) Strato of Lampsaenus departed essentially from the systems both of Plato and Aristotle; for though he made nature inanimate, and acknowledged no God but nature, yet it is not certain that he taught that the universe, or nature, was one simple being. His opinion seems to have approached much nearer to Spinozism than the *corpuscular* system, which see. (See also the article STRATO.) Whatever was the real notion of this distinguished Peripatetic philosopher, and whatever difference subsisted between him and the Epicureans, it is certain, that Alexander the Epicurean, who is supposed to have been contemporary with Plutarch, maintained, that God is matter, or not distinct from it; that all things are essentially God, that forms are imaginary accidents, having no real existence; and that all things are substantially the same. This extravagant opinion was embraced by some heretical Christians; as by one Amalric in particular, whose dead body was taken up and burnt, in the beginning of the 13th century, for having taught, that all things were God, and that God was all things, and the essence of all creatures; so that the creator and creature were the same; and that God was the end of all things, because all returned into him. These sentiments were adopted by his scholar David of Dinant, and several others; and the learned Peter Abelard has been accused of holding the same opinion. This notion has not been confined merely to Europe, but has made progress in the East; among the Japanese and the Mahometans; and the dogma of the soul of the world, is not only common in the East, but prevailed among the ancients, forming the chief part of the Stoic system, though in reality it is the same, with some shades of difference, with that of Spinoza. Some heterodox Stoics, as in particular Boethius, not only denied the world to be an animal, or intelligent being; substituting in the room of its mind or soul a plastic nature; but they also asserted the world's eternity and incorruptibility, or one constant and invariable course or tenor of things. The elder Pliny seems to have been of this opinion; for he declares, that the world, and that which is also called heaven, by whose circular motion all things are governed, ought to be believed to be an immense and eternal deity, such as was neither made, nor will ever be destroyed. (Nat. Hist. l. ii. c. 1.)

The *second* opinion, respecting the cosmogony, *viz.* that the substance of the universe is eternal, though the form be not, was generally adopted by the ancients, who inferred from the established axiom, "ex nihilo, nihil," or that nothing can be produced from nothing, that the creation of matter was an absolute impossibility; but, at the same time, had sufficient reason for believing that the world had not always been in its present state and order. Those who embraced this opinion may be divided into two classes; of which the first endeavoured to account for the generation of the world, or its reduction to its present form, from mechanical principles only, and the activity of matter, without having recourse to the assistance of any divine power; and the others introduced an intelligent mind as the architect and disposer of all things. No principle can be more absurd

than that which supposes matter to be uncreated; for, if matter was eternal and uncreated, and distinct from God, it owed its existence to its own nature only, depending on no other cause, either in respect of its essence or its properties. Moreover, it is contrary to all rules of reason, that another being should exercise so great a power over matter as entirely to change it, and form a world out of that which had been self-existent from all eternity without being a world. Besides, those who attribute the formation of the universe to mere matter and motion, suppose the eternal motion of matter; but if motion be eternal, it was either eternally caused by some eternal intelligent being, which would again introduce the deity, who, on their hypothesis, had been excluded; or it must be of itself necessary and self-existent; whence it would follow, that it must be a contradiction in terms to suppose any matter to be at rest, or to suppose that there might have been originally more or less motion in the universe than there actually was, both which consequences are too absurd to be admitted; or else, without any necessity in its own nature, and without any external necessary cause, it must have existed from eternity by an endless successive communication, which is also a plain contradiction; for an infinite succession of merely dependent beings, without any original cause, is a series of beings, which has neither necessity nor cause, nor any reason at all of its existence, neither within itself nor from without; that is, it is an express impossibility. Mr. Toland, indeed, (Lett. iii.) has ventured to assert, and pretended to prove, that motion, meaning the conatus, or endeavour to move, is essential to all matter; but this is a very unphilosophical position. The conatus to motion in any one particle of matter, must be either a conatus to move some one determinate way at once, or to move every way at once; but a conatus to move some one determinate way, cannot be essential to any particle of matter, but must arise from some external cause; because there is nothing in the pretended necessary nature of any particle to determine its motion, necessarily and essentially, one way rather than another; and a conatus to move equally every way at once, is either an absolute contradiction, or at least can produce nothing in matter, but an eternal rest of all and every one of its parts. (Clarke's Demonstr. of the Being and Attrib. of God, p. 66.) According to this second opinion, the state in which matter is supposed eternally to have been, is liable to several objections. The original of the earth they suppose to have been a chaos in a confused and disordered state; and to this chaos they attribute a certain motion, which they conceive to be irregular and tumultuous, but it was changed into a regular motion either by chance or divine power; but Aristotle has long ago observed, that the supposition of such an irregular motion destroys itself; as that which is infinite and eternal must necessarily have a regular and natural motion; and if the motion of the chaotic particles be natural, according to their several qualities and properties, the very possibility of matter's having continued in that state from eternity is destroyed; because, we thus introduce a principle, which will necessarily separate the several kinds of bodies one from the other, and that within a certain limited space of time. This principle also renders the assistance of a deity unnecessary; for if the chaos be acknowledged to have in itself all the internal power that is requisite for the separation of its parts, and the placing of every element in its proper situation, there can be no occasion for the intervention of any external cause. (See CHAOS.) It is necessary, therefore, if we would reason justly concerning the production of the world, to consider God as the author of nature, and as the first and sole principle of motion. Without a

deity, we shall be involved in an endless labyrinth of absurdities and contradictions. Those philosophers, therefore, determine reasonably, who assert that the world had a beginning, and was once formed out of a confused chaos. And though, without a divine revelation, the æra of its commencement cannot be ascertained; yet, we have strong presumptive proofs, that the present frame and constitution of the earth, at least, have been of no very ancient date. To this purpose, the following circumstances have been mentioned: The changes which must necessarily, and in the ordinary course of nature occur in the earth during a long interval of time, by putrefaction, the subsidence of mountains, the daily encroachments of the land upon the sea, the consumption of water, and other innumerable accidents; the universal tradition of the most ancient nations, both learned and barbarous; the population of the earth; the late original and invention of all arts and sciences; the shortness of the history of the earth, which reaches up to a very few years; the manifest absurdities and contradictions of those few accounts which pretend to a greater antiquity; the impossibility that universal deluges, or other accidents, should at certain long periods have often times destroyed the far greater part of mankind, with the memory of all former actions and inventions, and yet never have happened to destroy them all: these circumstances, and many more considerations, deduced from nature, reason, and observation, render it exceedingly probable, that the formation of the earth was novel, and of no great antiquity. And, it is not to be doubted, that the doctrine of those ancient poets and philosophers, who taught that the world had a beginning, was founded on still more ancient traditions, which were so many authorities to them, as their testimonies are at this day to us. (See Nicholl's Conf. of a Theist, vol. i. p. 1. Clarke's Disc. concerning the Evidences of Nat. and Revealed Religion, p. 252. Burnet's Theory of the Earth, b. i. c. 4.) Under this head, many different hypotheses of cosmogony have been framed; and in the recital of them, we shall begin with those which, excluding all divine interposition, accounted for the formation of the universe from the properties and action of matter only. The first is, that of the Phœnicians, transmitted to us by Sanchoniatho, and taken originally, as he assures us, from the cosmogony of Taautus, who was the same with the Egyptian Thoth, the Hermes of the Greeks, and the Mercury of the Romans. According to his account, the first principles of the universe were a spirit of dark air, and a turbid obscure chaos, which, for many ages, had no bounds; and the formation of all things began by the conjunction of this spirit with its own principles, which produced "mot," derived by Bochart from the Arabic, *madab*, signifying, as he says, the first matter of things. But as Sanchoniatho makes the chaos, and not mot, to be the first material principle; Cumberland deduces it from another Arabic word, *matha*, denoting to sleep or macerate in water, whence is formed *mauth* or mot, signifying such a solution or confusion, denominated by some mud, and, by others, a corruption of a watery mixture, which became the seed of all creatures, and hence proceeded the generation of the universe. From certain animals which had no sense, proceeded others that were intelligent, called "Zophasemin," *i.e.* the contemplators of heaven, being formed alike in the shape of an egg; and upon this mot, with the sun, moon, stars, and larger constellations, immediately shone forth; and from this relation it hath been inferred, that Thoth considered the earth as a planet. The air being intensely enlightened by the violent degree of heat communicated to the sea and earth, winds were generated and clouds, and great de-

scents and defluxions of the celestial waters; and when they were separated and drawn from their proper place by the heat of the sun, and then met again in the air, and dashed against one another, thunder and lightning were engendered; and at the noise of the thunder, the above-mentioned intelligent animals awoke, terrified with the sound, and male and female moved on the earth, and in the sea. Eusebius of Cæsarea, who has preserved this fragment, observes, that this cosmogony of the Phœnicians introduces atheism; Sanchoniatho having delivered no theology concerning the supreme God, nor concerning the inhabitants of heaven, or angels. Bishop Cumberland considers this account of the origin of things as a professed apology for the idolatrous worship paid to dead men, and the several parts of the universe. Whereas, others think that Eusebius would rather wish to render the theology of the pagans ridiculous and absurd; and that, by the most favourable interpretation of the words of Sanchoniatho, it is not improbable that the Phœnicians supposed two principles, one of which was a turbid dark chaos, and the other a spirit, or an understanding prolific goodness, forming and hatching the corporeal world into perfection; the eternity of which spirit seems also to be asserted by the declaration, that it knew not its own generation, that is, had no original at all. This Phœnician cosmogony being confessedly taken from that of Thoth, agrees in substance with the Egyptian. (Sanchon. apud Euseb. Præp. Evang. l. i. c. 10. Cumberland's Rem. on the Cosmogony of Sanchon. Cudworth's Intell. System.) The account of the origin of the universe, given by Diodorus Siculus, (lib. i.) is generally supposed to be the cosmogony of the Egyptians; and it is as follows.

When the universe first coalesced, heaven and earth were of one form, their nature being blended together; but afterwards, as bodies separated, the world took on it the entire disposition wherein we now behold it, and the air began to have a constant motion; upon which, its fiery parts flew to the upper regions, being naturally carried upward by their own levity; and hence proceeded the rapid circular motion of the sun, and other stars. The muddy and turbid matter, after it had been incorporated with the humid, subsided in one place by its own weight, and, being agitated with continual internal volutations of the watery parts, the sea became formed, and of the more solid the earth, which was slimy and very soft at first; but, stiffening by the rays of the sun, the surface began to ferment, by reason of the heat; and some of the humid parts swelled, and rose by degrees into putrid pustules, covered with thin membranes. The humid matter, thus fecundated by the genial heat, by night received nutriment from the mist falling from the ambient air, and by day grew more and more solid by the sun's warmth, till at length the inclosed brood being arrived at perfect maturity, and the membranes burnt up and burst, all kinds of creatures were produced. Of which those that had obtained the greater degree of heat, became volatiles, and flew upwards; those, in which the earthy concretion prevailed, were placed in the rank of reptiles, and other terrestrial animals; and the creatures, which chiefly consisted of a watery nature, repaired to a congenial element, and were called fish. At length the earth, continually hardening more and more by the heat of the sun, and by the winds, could no longer produce any of the larger animals; but they began to propagate their several species by generation. And, to obviate any objection against the possibility of the earth's producing living creatures, our author instances in the vast number of mice, which are said to be bred in the Upper Egypt, out of the putrified mud, after the overflowing of the Nile.

COSMOGONY.

This cosmogony is charged with being a mechanical explanation of the generation of the world, without any help from God; and Eusebius observes, that the name of God is not so much as mentioned in it, but a kind of fortuitous and spontaneous formation of the universe introduced. From this imputation of acknowledging no deity besides stupid matter, the Egyptians have been strenuously defended by Dr. Cudworth (*Intell. Syst.*); and we have the authority of Plutarch (*Isis and Osiris*) for supposing, that the Egyptians admitted an active principle, or intelligent power, eternally united with the chaotic mass, by whose energy the elements were separated, and bodies were formed, and which continually presides over the universe, and is the efficient cause of all effects. The testimony of Plutarch is corroborated by that of many other writers. (See *AGATHODEMON* and *ΚΝΕΡΗ*.) Notwithstanding what has been advanced, in support of the contrary opinion, by Eusebius, Porphyry, and others, it appears highly probable that the ancient Egyptians acknowledged an active as well as a passive principle in nature, and, as Plutarch asserts, worshipped *τὸ πρῶτον ἔξω*, the supreme deity. The Egyptian priests also taught, that the earth had certain periods of revolution, being alternately destroyed by water and fire, and renewed again.

As to the Chaldeans or Babylonians, Diodorus says, they held the nature of the world to be eternal, and that it had neither any original generation, nor is subject to any future corruption; yet that the order and beautiful disposition of all things were caused by a divine providence; and that whatever are now in the heavens were not casual, or spontaneous, but perfected by the determinate and established decree of the gods. From the account given by Berofus of the Chaldaic cosmogony, it appears that the old Babylonians expressly attributed the orderly disposition of the world, the perfecting of the heavenly bodies, and the formation of men and animals, to their supreme god, Bel; though they seem to have held the pre-existence of matter. It must, therefore, be some theology of the later Babylonians, which could with justice be charged with passing over in silence the one principle of the universe (see *Cumberl. Cosm. Sanchon. p. 280.*); in which they must have departed from the tradition of their ancestors, the ancient Chaldeans, who were celebrated for their acknowledgement of one sovereign deity, or maker of the world, as appears from that oracle of Apollo, cited by Eusebius from Porphyry, where the Chaldeans and Hebrews are alone declared to be possessed of the true wisdom, as worshipping God, the self-begotten king, in an holy manner. See *CHALDEAN Philosophy*.

The ancient pagan poets, who greatly contributed to the depravation of theology in general, have particularly countenanced the opinion of the world's having been produced from a chaos, without the intervention and influence of God. For an account of the cosmogony of Orpheus, see *ORPHEUS*. The cosmogony of Hesiod is somewhat confused, commencing twice from the chaos, and relating things rather in a poetical than a philosophical order. The substance of what he delivers is, that in the beginning the chaos first existed, then the widely-extended earth, and next love, the fairest of the immortal gods; that the chaos produced Erebus and Night, from the conjunction of which two issued Æther and Day. After which he proceeds to give an account of the separation of the heavens and stars from the earth, the raising of mountains, and the sinking of caves; and of the production of the sea, from the heavens and earth together. Aristophanes has given a much more methodical and complete description of this ancient cosmogony. His account is ludicrously introduced in a comedy; but it is conceived to have been a sketch of the old atheistic system, and

may be thus explained. Chaos, or matter, confusedly moved, being the original of all things, did thence rise up gradually from lesser to greater perfection; first, inanimate things, as the elements, heaven, earth, and seas; then, brute animals; afterwards, men; and, last of all, gods; as if not only the substance of matter, and these inanimate bodies of the elements, fire, water, air, and earth, were first in order of nature before God, as being themselves also gods, but also irrational animals at least, if not men too. And this is the atheistic creation of the world, gods, and all, out of senseless and stupid matter, or dark chaos, as the only original deity. (*Cudw. Intell. Syst.*) For the opinions of several ancient philosophers concerning the origin of the world, and the manner of its formation; see *THALES*, *ANAXIMANDER*, *ANAXIMENES*, and *ANAXAGORAS*. The next atheistic system of philosophy and of cosmogony, which we shall mention, is the *atomic*; for an account of which, see this article. The doctrine of Leucippus and Democritus, to whom this system is ascribed, as to the origin of the world, was, that the first principles were an infinite number of atoms, or indivisible particles, of different sizes and figures, which, moving fortuitously, or without design, from all eternity, in infinite space, and encountering one another, became variously implicated and entangled, and produced first a confused chaos of all kinds of particles, which afterwards, by continual agitation, striking and repelling each other, disposed themselves into a vortex, or vortices, where, after many convolutions and evolutions, motions and essays, in which all imaginable shapes and combinations were tried, they chanced at length to settle into this present form and system of things. This hypothesis, as to the formation of the principal parts of the world, agrees with that of Epicurus, as it is represented by Lucretius, excepting that no mention is made of those vortices, which were an essential part of the former. To the two properties, attributed to atoms by Democritus, magnitude and figure, Epicurus added a third, *viz.* weight; without which he did not conceive they could move at all. See *EPICUREAN Philosophy*.

Those who, allowing the eternity of matter, introduce an intelligent mind as the disposer of it into the form which the world now bears, may again be subdivided into two classes: one, who, allowing no substance but matter, supposed it to be endued with understanding and life, and consequently to be God; and another, who held God and matter to be two distinct and independent beings. The first opinion, which differs but little from Spinozism, seems to have been that of Diogenes of Apollonia, and was certainly maintained by Hippafus of Metapontus, Heraclitus, and the Stoics. Hippafus and Heraclitus held fire to be the first principle, of which all things were made; into which, after the revolution of certain periods, they will be again resolved; and that this fire was God, whom Heraclitus described to be the most subtle and swift substance which permeates or passes through the whole universe. Heraclitus's account of the formation of the world was, that the fire being extinguished; the grossest parts of it coalescing made the earth, which, being loosened by the fire, produced water, and from the exhalation of this water the air was generated. Hippocrates had the same notion of the deity with Heraclitus, declaring his belief to be, that heat or fire was immortal and omniscient, and that it saw, heard, and knew all things, both present and future.

The Stoics held two first principles: God, and matter void of all quality; the one active, and the other passive, and that they were both corporeal; for they did not acknowledge any such thing as incorporeal substance; by

which means they strangely confounded themselves, and reduced their two principles in effect to one and the same. See STOICS. With the notions of the Stoics concerning the constitution of the world, agrees the doctrine which is laid to be almost universal among the Pundits, or learned men, in India, and secretly entertained by the Sophis and learned men of Persia. There is also a sect among the Chinese, who acknowledge nature to be the sole deity, thereby understanding that natural power or operation, which, being the efficient cause of motion and rest, produces, maintains, and preserves all things. But the opinion more commonly embraced at this time by the Chinese, and in which the atheism which has been so prevalent among them consists, approaches nearer the Stoic doctrine. (See CHINA.) The Siamese have also some agreement with the Stoics, in their notion of the alternate destruction and renovation of the universe. (See CONFLAGRATION.) Another class of persons comprehends such as held two distinct and independent principles, co-existent from eternity, God and matter: and this is supposed to have been the opinion of Pythagoras and Plato; and was certainly that of Anaxagoras, Archelaus, and several others. (See PHERECYDES, PLATO, and PYTHAGORAS.)

The third and last, and only true opinion concerning the origin of the universe is held by those, who assert that the world had a beginning, being produced by God out of a state of non-existence; and consequently, that it is in its own nature liable to dissolution. Besides such of the nations and philosophers already mentioned, who most probably believed this creation of the world, though suspected of contrary opinions, there were several among the heathens who unquestionably belonged to this class. Such were the ancient *Tuscans*, or *Etrurians*; the *Druids*; the *Magi*, among the ancient Persians; the *Brachmans*, and *Bramins*; which articles see respectively. Before idolatry prevailed in China, they acknowledged one God, or supreme, eternal, omnipotent Spirit, the lord of heaven and earth, the governor and director of all things, whom they worshipped under the name of Shang-ti. They held, that a chaos was the beginning of things, from which God produced whatsoever is material in the universe. See CHINA, and also JAPAN. Cudworth's Intellectual System. Brucker's Hist. of Philos. by Enfield, vol. i. Anc. Un. Hist. vol. xviii. Appendix.

For an account of modern theories of cosmogony, see CARTESIAN *Philosophy*, CREATION, and *Theory of the Earth*.

COSMOGRAPHY, from *κοσμος*, world, and *γραφω*, I describe, the description of the world; or the art which teaches the construction, figure, disposition, and relation of all the parts of the world, with the manner of representing them on a plane.

Cosmography consists chiefly of two parts: *astronomy*, which shews the structure of the heavens, and the disposition of the stars; and *geography*, which shews those of the earth.

COSMOLABE, from *κοσμος*, world, and *λαμβανω*, I take, an ancient mathematical instrument, serving to measure distances, both in the heavens, and on earth.

The cosmolabe is in great measure the same with the astrolabe. It is also called *pantacosin*, or the *universal instrument*, by L. Morgard, in a treatise written expressly upon it, printed in 1612.

COSMOLOGY, from *κοσμος*, world, and *λογω*, discourse, the science of the world in general. This Wolfius calls *general or transcendental cosmology*, and has written a treatise on the subject, wherein he endeavours to explain how the world arises from simple substances; and treats of the general principles of the modifications of material things,

of the elements of bodies, of the laws of motion, of the perfection of the world, and of the order and course of nature. Wolf. *Cosmologia Generalis*, Francfort, & Leipsic, 1731. 4to.

COSMOPOLITE, or COSMOPOLITAN, a term sometimes used to signify a person who has no fixed living, or place of abode; or a man who is a stranger no-where.

The word comes from *κοσμος*, mundus, and *πολις*, city.

One of the ancient philosophers being interrogated what countryman he was, answered he was a cosmopolite, *i. e.* "an inhabitant or citizen of the world." "I prefer," says another philosopher, my family to myself, my country to my family, and the human kind to my country."

COSMOPOLITICAL FEDERATION, denotes a concert between all the nations of the earth for arranging their disputes by means of umpires, instead of armies; the possibility of which is discussed by professor Kant, in a Berlin Magazine for the year 1784.

COSMOS, in *Ancient Geography*, a town of Palestine, E. of Jordan. Ptolemy.

COSNAC, in *Geography*, a town of France, in the department of the Lower Charente, near the Gironde; 18 miles S. of Saintes.

COSNE, a town of France, in the department of Nièvre, situated on the river Loire. It is the chief place of a district, and has a sub-prefect, and a court of justice. The number of its inhabitants amounts to 4709. The canton has 10 communes, with 11,515 inhabitants, on an extent of 165 kilometres, but the whole district counts a population of 57,788 individuals, and 66 communes, on a territorial extent of 1397 kilometres and a half. The district of Cosne produces good wine, and abundance of corn. It has several iron mines and forges. Its principal trade is in hardware and cutlery.

COSPEAN, PHILIP, in *Biography*, a celebrated French preacher and prelate, who flourished in the beginning of the seventeenth century. In early life he studied under Lipsius, and in 1604 became one of the doctors of the college of the Sorbonne. As a writer he is known as a controversialist in theological subjects; but his fame as a preacher was very remarkable, especially for having introduced in his discourses illustrative citations from the sacred writings, which is perhaps one of the most useful modes of preaching. He was successively bishop of Aire, Nantes, and Lizeux, and died in 1646 at the age of seventy-eight.

COSPODA, in *Geography*, a town of Germany, in the circle of Upper Saxony, near Neustadt.

COSPOUR, or COSPORE, a town of Asia, the capital of CACHAR, in the kingdom of Ava, or Birman empire; 376 miles E. of Patna. N. lat. 24° 56'. E. long. 92° 57'.

COSS, a measure of length, used in Hindoostan, the standard of which has varied at different periods, according to the caprice of the emperors. The first person who made a great innovation in this standard was Acbar, who directed it to be taken at 5000 guz, equal to 4757 yards, *i. e.* about two British miles and five furlongs; and Shah Jehan, about half a century afterwards, increased the standard one-twentieth part, making the coss more than two miles and six furlongs. But since the time of Aurungzebe, the ancient, or common, coss has resumed its place, and those of Acbar and Shah Jehan are only heard of in the histories of the times when they were in use. All the cosses of the Ayin-Acbar are of the old standard, that is, the common or Hindoostanny coss, such as Acbar found in use when he ascended the throne. Although the estimated length of the coss varies in different parts of the country, it does not appear that this variation through the whole of

it amounted to so much as one-sixth part; and between the northern and southern extreme of India, that is, in an extent of about 1700 miles, the difference is not more than one-sixteenth part. The mks, it is well known, vary much more in their proportions in the different parts of Europe. Taking the medium of the cofs throughout Hindoostan, and the Deccan, there will be about 40 of them to a degree of a great circle on the globe; that is, each cof is about a geographical mile and a half. In road measure the cofs is about one statute mile and nine-tenths, or at the rate of 190 British miles to 100 cofs; one part in seven being allowed for winding, when the line of distance is extensive:—or, seven miles of road measure are allowed to produce six miles horizontally, or in a direct line. In Malwa and its neighbourhood, the cofses are larger than any where else, and are about 1.7 geographical mile each, or 35 to a degree; and in the road from Baglana to Masuhpatam they are so short, that 45 are required to make a degree. The proportions adopted by major Rennell (in his “Memoir”) for Hindoostan, Malwa, and the Carnatic, from a great number of examples, are respectively 1.43, 1.71, and 1.6 of geographical miles to a horizontal cof; or 42.35, and 37½ to a degree of a great circle. The cofs of Hindoostan Proper is therefore shorter than any other, and prevails throughout the greatest extent of country. In Nagpou (the ancient Goondwaneh) there is a *Goondy* cof, which is, at a mean, about 2.76 geographical miles, reduced to horizontal distance; or 21.9 or 22 to a degree. This measure appears to be in use by the natives throughout Mundilla and Boggilcund, as well as in Nagpou; and sometimes occasions great confusion in the reports of the “coffils,” or couriers; however, they have a computation of Hindoostanny cofses also, in the same country; and the proportions agree in general remarkably well with that scale, between the Bengal provinces and Aurungabad, and between Mundilla and Hydrabad.

Coss, *Rule of*, in *Mathematics*, was used for the science of algebra, when it was first introduced into Europe by means of the Italians, who named it “*Regola de cosa*,” or the rule of the thing; the unknown quantity, or that which was required in every question, being called “*cosa*,” the thing, whence we have cofs, and coffic numbers, &c. See ALGEBRA.

COSSA; in *Ancient Geography*, a town of Italy, in Oenotria. Steph. Byz.

COSSA. See COSA.

COSSACKS, or KOZACKS, is the general name of the nations of the Ukraine, on the frontiers of Russia, Little Tartary, and northern Turkey, in the governments of Kief, Tschernigof, Novgorod Sibirsk, Kursk, Orel, Tambof, &c. Their language is the Russian, their religion the Greek, and their vocation to defend the extensive frontiers of the Russian empire, against the incursions of the Tartars and other savage tribes. Unlike the rest of the Russian peasants, they cannot be given away as serfs, neither do they furnish recruits for the army; but they all serve as light horsemen, and receive pay only when they are in actual service.

The name Cossack or Kozack is probably Tartarian. It signifies an armed warrior. So early as the ninth century the emperor Constantine Porphyrogeneta mentions a country of Kafachia between the Euxine and the Caspian seas, at the foot of the Caucasian mountains; and in the year 1021, prince Mitislaf, son of the great Vladimir, made war upon a nation called Kosagi. Both seem to be the same people, and of Tartarian origin.

By reason of their federal constitution, military and civil, the Cossacks form a distinct part and class of the Russian nation. This constitution they obtained after the destruction

of the Tartarian empire, when the Russian government appointed them the guardians of the new frontiers, and allotted certain districts of the country for their support. The Cossacks have no nobility, consequently no vassals. All are brethren, and may reciprocally command and obey. They elect their superiors from their own body, reduce them again to the common level, and choose others in their stead. The commander in chief alone is appointed by government, and in constant pay. The Cossacks are obliged to clothe themselves at their own expence, to provide themselves with horses and arms, and to be at all times completely ready to march. While in actual service each common man receives the munition and the pay of a soldier, *viz.* twelve roubles a year. They enter the service at the age of eighteen, and obtain their discharge at fifty. As countrymen they call their commanders in the *stanitzas*, villages, *starshini*, aldermen, and over towns and districts, *attamans*, corruptly hetmans. As militia they have subaltern officers, *desiatniki* and *piatidesiatniki*, over tens and fifties; captains, *juniki*, over hundreds; and every regiment, which, according to the extent of the district, is from one thousand to three thousand men strong, has a general officer, *vojskovoï attaman*. A regiment is called a *polk*, and a whole division of Cossacks is under the command of a *glavnoi attaman*. The officers have the rank of officers of the regular militia.

The weapons of the Cossacks are, a lance headed with iron, about a span long, with a shaft of three yards and a half in length, a sabre, a firelock or pistols, or only a bow and arrows. The lance is generally decorated with a small streamer just below the iron. The *kantshio*, a plaited leather lash, an ell long, and an inch thick, fastened to a short stick, may also be reckoned among their weapons, since besides exercising it upon their horses, they use it against an unarmed or conquered enemy. Their saddle is merely a wooden frame, under which they lay a piece of felt, to save the skin of the horse. They are all expert horsemen, and their hardy and swift, though miserably looking horses, are well taught, and perform wonders. Each polk or regiment has two or more banners of silk, with the figure of some patron saint; but they have neither drums nor martial music. Each man has two horses.

On their expeditions the Cossacks are encumbered with no tents or baggage. A piece of felt is their cloak and their bed. Provisions and forage are carried by the second horse.

The Cossacks by their origin, as well as by their present constitution, are divided into two main branches, *viz.* the *Cossacks of Little Russia*, and the *Cossacks of the Don*. From the former are derived the *Slobode* regiments in the government of Charkow, and the *Zaporogians*; and from the Cossacks of the Don the *Volgaijki*, *Grebenski*, *Orenburgski*, *Uraljki*, *Sibirski*, &c.

During the Polish wars, numerous bodies of fugitive Cossacks fled from the western to the eastern side of the Dnieper, into the southern provinces of the Russian empire, where, preserving their military constitution, they settled in an uninhabited but fertile region, partly in the government of Charkow, and partly in those of Kursk and Voronezh. This is the origin of what are called the *Slobode* Cossacks. The country in which they were established had anciently belonged to the grand duchy of Kief, and from the time of its being first overrun by the Tartars in the year 1240, had remained a desert the whole eighty years that their dominion lasted. When the Cossacks returned to the desolated inheritance of their fathers, they were well received by the czar Alexis Michaelowitch.

The second colony of the Cossacks of Little Russia, called *Zaporogian*

Zaporogian Cossacks, from *za*, beyond, and *porogi*, cataracts, their *setcha*, or principal settlement, being near the cataracts of the Dnieper, arose from part of the young unmarried men having been stationed on the southern borders of the Ukraine, where the Dnieper falls into the Euxine. By degrees they came to a total separation from the parental stock, and erected a military state of their own. They became so distinguished for their bravery and skill in desultory war, that persons flocked from distant regions to this society of warriors. No women were admitted in the *setcha*. Those Cossacks who were disposed to marry were permitted to settle in the neighbouring district, with the privilege of re-admission, provided they were not attended with their wives and families, whom they were allowed occasionally to visit. The *Zaporogians* increased their numbers by affording an asylum to deserters, and by forcing and enticing youths and children from the Ukraine and Poland into their community. They frequently performed incredible feats of valour in the campaigns of the Russians against the Turks and Tartars; nor were their services confined solely to land; by their skill in navigating the Dnieper, they occasionally defended the mouth of that river, and attacked with success the armed vessels on the contiguous coasts of the Black sea. Their boats were rowed by fifty or sixty men, had no sail, and generally carried two small cannon.

But while the *Zaporogian* Cossacks were thus terrible to their enemies, they were scarcely less formidable to their allies. Though nominal subjects of the Russian empire, they pillaged the Russian merchants who passed through their country, and interrupted the navigation of the Dnieper by continual piracies. This induced the Russian government to destroy their *setcha* in 1775. However the *Zaporogian* Cossacks still subsist, only under another name. By an ukase of the 30th of June 1792, Catherine II. gave them the island of *Taman* belonging to the province of *Taurida*, with the whole tract of country between the river *Kuban* and the sea of *Azof*, as far as the rivers *Yeya* and *Laba*, which Mr. Tooke computes at 1017 English square miles in extent. Under the name of *Cossacks of the Euxine*, they obtained the right of electing their own attamans, but are immediately dependent on the governor of the province of *Taurida*.

The second main branch of Cossacks comprehends the *Donskoi*. They have this appellation from the region of the River *Don*, which they have constantly inhabited and most probably derive their descent from *Novgorodian* Russians. Their first settlements on the *Don* must have taken place after the Tartars were driven from those parts. Their first appearance as warriors among the Russian troops is in the year 1579, when 3,000 of them formed part of the army which the Czar *Ivan Dassiowitch* marched against *Livonia*.

The *Donskoi* Cossacks inhabit the plains about the *Don*, between the governments of *Saratof*, *Caucasus*, *Voroneths*, and *Ekatarinofslaf*, as far as the sea of *Azof*. Internal revolutions have given birth to many emigrations of the *Donskoi* Cossacks. The earliest happened to the *Volga*. In the year 1734, these *Volgaic* Cossacks were declared independent on those of the *Don*, but two colonies of them are only subsisting now, the *Dubofskoi* and the *Astrachanskoi*. The former have their chief seat in the little town of *Dubofka* on the right bank of the *Volga*, and their territory lies between *Dmitrefsk* and *Tzaritzin*. The *Astrachan* Cossacks dwell partly in the city of *Astrachan*, and partly in the villages around.

A second colony of the *Donskoi* Cossacks are *Grebenskoi*, who separated from their parent stock about the same time with the *Volgaic*, and settled about the River *Terek*, whence they are also called *Terekskoi* Cossacks. In a campaign of the

Czar *Ivan I.* against the *Caucasian* Tartars, a body of them penetrated into a part of this great chain of mountains which from its prominent rocks was compared to a comb, *Greiben*, and on this occasion they received the name of *Grebenskoi* Cossacks. Near these dwell the *Semeinskoi*, who are of the same origin.

The *Orenburg* Cossacks separated still later from their common stem. They dwell along the rivers *Samara*, *Ui*, and *Ural*, from *Verkuralisk* to *Ilezk*, and in the petty forts erected against the *Kirghisians* and the *Bashkirs*.

But one of the most numerous and most powerful branches of the *Donskoi* Cossacks is that of the *Uralskoi*, formerly called the *Yaikskoi* Cossacks, the river *Ural* having anciently been known by the name of *Yaik*. Their residence is on the right shore of the *Ural*, where, besides their capital *Uralisk*, they possess the important town of *Gurief* on the *Caspian*, and defend the forts of the *Ural* against the *Khirgilians*. They chiefly live on fishing, especially the various kinds of sturgeon of which they make caviar. Besides the winter, spring, and autumn fishing, they fish particularly in the months of *October* and *December*, for the Imperial table. The fish caught at that time is sent by deputations to *St. Petersburg*, or *Moscow*. The first deputation carries from 60 to 100, the second upwards of 250 sturgeons. Besides the travelling and carriage charges, they receive sabres mounted in silver, and 800 roubles for the first, and one thousand roubles for the last deputation.

The *Siberian* Cossacks form the last, and in its origin the most remarkable branch of the great *Donskoi* family, numbers of which abandoned their homes on the *Don* in the 16th century, in order to plunder the countries situated eastward. They even acted as pirates on the *Caspian* sea, and spread terror on its shores. To chastise these audacious hordes, *Jvan II.* assembled a considerable fleet and army in the year 1577, but panic-struck at his preparations, the robbers fled into the neighbouring regions. A small body of six or seven thousand men, under the conduct of *Yermak*, proceeding along the rivers *Kama* and *Tschusslovaja* onwards to *Pernia*, ascended the *Ural* mountains, and pressing forwards to the *Tobol*, the *Irtish* and the *Oby*, subjugated Tartars, Vogouls and *Ostriaks*. Their conquests they formally made over to the Czar in 1581. More regiments of *Donskoi* Cossacks were sent to *Siberia*. They pushed their victorious career as far as the *Eastern* ocean and the mountains of *China*, and remained in *Siberia* to keep the reduced nations in obedience. See *SIBERIA* and *YERMAK*.

In 1804 there were ten regiments of regular Cossacks in constant pay in the Russian army, amounting to 9429 men organized as hussars or light dragoons; and 98,211 irregular Cossacks who receive no pay but when in actual service. Coxe's Travels, vol. iii. Tooke's View of the Russian Empire, vol. i. Storch's *Russland unter Alexander* Demerlten.

COSSÆI, in *Ancient Geography*, a people of Asia, who, according to *Polybius*, inhabited the mountains of *Media*. *Diodorus Siculus* adds, that they were a warlike nation, who availed themselves of their difficult passes, and at first refused to submit to *Alexander*; but this conqueror, having established a flying company there and ravaged their country, reduced them in 40 days, afterwards passed the *Tigris*, and marched towards *Babylon*. *Quintus Curtius* says, that they inhabited a mountainous country. *Plutarch* calls them "Cossæi;" but *Arrian*, *Ptolemy*, and *Pliny* call them *Cossæi*. The latter places them to the east of *Susiana*; *Ptolemy* places them in *Susiana*, towards *Assyria*; and *Arrian* says, that their country was contiguous to *Media*, and on one side adjoined that of the *Elymæans*.

COSSART LAMB, in *Rural Economy*, is a term applied to a lamb which is left to itself, or to be brought up by the hand, in consequence of having lost its mother or dam, before it was capable of providing for itself; or to a lamb taken from an ewe that brings two, three, or four at a yearning, and consequently is incapable of bringing them all up. In all or many of these cases if there be not another ewe at liberty to suckle and to take care of them, they must be brought up by the hand, or perish. By an ewe being at liberty is meant, one that has, by some accident, lost her lamb, and has milk enough to suckle one yearned by another. The term is also applied to a colt, calf, &c. which is brought up in the same manner.

COSSATO, in *Geography*, a small town of France, in the department of *Sesia*, which was formerly part of Piedmont in Italy: It has 2473 inhabitants, and is the chief place of a canton, which contains 11 communes, and a population of 9551 individuals.

COSSAY, or **CASSAY**, a province of Asia, in the northern part of the country of Ava. See **MECKLEY**.

COSSE de genisse, an order of knighthood instituted in 1234, by Lewis IX. at his marriage with Margaret of Provence. The motto on the collar of this order was *exaltat humiles*.

COSSE, CHARLES DE, in *Biography*, marshal de Brissac, was born about the year 1506, and educated with Francis, dauphin of Viennois and duke of Brittany, of whom his father was governor. He devoted himself to arms, and was greatly distinguished in several wars, on account of which his sovereign Francis I. created him a knight of his order. After successfully serving in various parts of Italy, he returned to France, and contributed not a little to the capture of Havre de Grace from the English. He died of the gout in 1563, leaving behind him a character of great worth, for energy, integrity, and humanity. Many anecdotes are on record that do much credit to Cossé, as a man and an officer; of these we shall mention but one. Having fulfilled a commission in Piedmont, and no farther business being left for his army, it was disbanded; the men, not knowing how to obtain the means of subsistence, exclaimed in an angry tone "Where shall we get bread?" "Of me" said the general "as long as I have any." At the same time the people who had advanced goods to the soldiers on the word of Brissac entreated him to save them from ruin. He gave them all that he possessed, and then invited them to accompany him to the court of France. The Guises refused to afford the necessary relief, upon which the marshal said to his wife; "Here are the people who have ventured their property upon my promises; government refuses to sanction the agreement, and they are ruined." "Let us defer the marriage of our daughter, and give to these unfortunate people the money destined for her portion." The lady acceded to his wishes, and he was thus enabled to pay half the debt, and give security for the remainder. *Moreri*.

COSSE le Vivien, in *Geography*, a small town of France, in the department of Mayenne, with a population of 3412 individuals. Its situation is 12 miles S. of Laval, and it is the chief place of a canton which has 11 communes, and 9981 inhabitants, on a territorial extent of 265 kilometres.

COSSEA, in *Ancient Geography*, a country of Asia, forming part of Persia Propria. *Steph. Byz.*

COSSEIR, or **COSSIR**, in *Geography*, a town of Upper Egypt, situated on the shore of the Red sea, among hillocks of floating sand. The houses are built of clay, so that Bruce calls it "a small mud-walled-village." It is defended by a square fort of hewn stone, with three square towers in the angles, which are surmounted with three small cannon of

iron and one of brass, in very bad condition; serving merely to terrify the Arabs, and hinder them from plundering the town when full of corn, for the use of Mecca in time of famine. The ramparts are heightened by clay, or by mud-walls, to secure the soldiers from the fire arms of the Arabs, that might otherwise command them from the sandy hills in the neighbourhood. The number of settled inhabitants is very small, though the strangers, who are continually passing and repassing, augment them prodigiously. At Cossair they have no great supply of provisions, as there is no cultivable land near the town. The butter they use is brought from Arabia. They are supplied with good water, that of the wells near the town being brackish, by the Bedowens from Terfowey, at the distance of three hours. The dress, and apparently the language, of the people of Cossair approaches nearer to those of the eastern shore of the Arabian gulf than to those of the Egyptians. They are armed with the *Jambia*, a crooked knife, not less than a yard long, and commonly a lance. Upon the whole they appear, says Mr. Browne, rather settlers from the opposite shore than Egyptians. The commerce in coffee is not inconsiderable. Formerly the whole of Upper Egypt was supplied with coffee by way of Suez and Cairo, but the Beys having imposed a very heavy duty on that commodity, the inhabitants began to import from Cossair for themselves, whence they are now supplied with the best coffee; and at a cheaper rate than from Suez. The town is provided with excellent fish, and pepper, and other spices, are brought hither free of duty. Some Abyssinian slaves transplanted from Jidda are landed here, and carried to Cairo; but their number is very small. The port, if it may be so called, is on the S.E. of the town; being merely a rock which runs out about 400 yards into the sea, and defends the vessels, which ride to the W. of it, from the N. and N.E. winds, as the houses of the town cover them from the N.W. Within a large space inclosed by a high mud-wall, every merchant has a shop or magazine, for his corn and merchandize; of which last little is imported, besides coarse India goods, for the consumption of Upper Egypt itself, since the trade to Dongola and Sennaar has been interrupted. Cossair, says Mr. Bruce, has been mistaken by different authors. M. Huet, bishop of Avranches, says, it is the "Myos Hormos" of antiquity; others, the "Philoteras portus" of Ptolemy. He says, that neither the one nor the other is the port, both being considerably farther to the northward. The present town of Cossair, he says, was no ancient port at all; old Cossair having been 5 or 6 miles to the northward. Without doubt, says Bruce, it was the "Portus albus," or white harbour. Ptolemy places here the "Accaba," denoting in Arabic a steep ascent or descent, which is found, as well as the marble mountains, towards Terfowey; and the "Aias" mountain of the same geographer is found over Cossair, on which and a neighbouring mountain are two chalky cliffs, which, being conspicuous at such a great distance, have given the name of white port to Cossair, by which it was anciently distinguished. Mr. Browne informs us, that the rough and lofty rocks of porphyry and granite with which Cossair is environed exhibit a magnificent and terrific appearance; and the level road between this place and Ghenné, suggests the idea of immense labour in cutting it. All these circumstances, he says, concur in testifying the importance Cossair must once have had as a port. At certain distances in the highest rocks is observable a succession of small structures, formed with uncemented stones, which, by internal marks of fire, seem to have served as signals. Cossair is situated, according to Bruce, in N. lat. 26° 7' 51" and E. long. 34° 4' 15". Bruce's Travels, vol. i. p. 193. Browne's Travels, p. 145, &c.

COSSETANIA, a country of Spain, according to Pliny and Ptolemy; the former of whom places in it the river Subi and the town of Tarragona.

COSSET-LAMB. See **COSSART-LAMB.**

COSSI, or **CASSII**, in *Ancient Geography*, a people of Britain who are supposed to have inhabited some parts of Hertfordshire, perhaps the hundred of Caishow. See **CATTIVELLAUNI**.

COSSIERS, **JEAN**, in *Biography*, an historical painter, was born at Antwerp in 1603, and was educated under Cornelius de Vos. After this he improved himself by travelling, and the reputation of his talents became known in foreign courts, and he was employed to paint several pictures for the king of Spain, the cardinal Infant, the archduke Leopold, and the princes. Cossiers composed well; his figures are correctly drawn, and his back-grounds are rich and frequently ornamented with architecture. His manner of painting is broad, and his tone of colouring generally good, though sometimes a little too yellow. In the church of Des Beguines at Malines are five pictures of the passion of our Saviour, and over the great altar three others, representing the crucifixion, which rise to the roof of the church. Cossiers sometimes painted portrait. His own head is engraved by P. de Jode. He was director of the academy at Antwerp in 1639. Heineken. Pilkington.

COSSIMBAZAR, or **COSSIMBUZER**, in *Geography*, a small city of Hindoostan, in the country of Bengal, nearly adjacent to Moorshedabad, which was at all times the place of residence of the different European factors; this being the centre of their trade.

COSSIMBAZAR island, a district of country so called, because it is surrounded by the Hoogly, Cossimbazar, and Ganges rivers. While the nabobs of Bengal continued to be independent princes, or nominally subjected to the court of Delhi, they resided chiefly in this island, at least during the last century. At Moorshedabad, the capital, the Durbar was held, and the English resident had a kind of fortrefs assigned him; and his attendants, about four miles distant, near the populous village (called a city) which bears the same name with the island. It is surrounded by a stone wall which still remains; and the house affords elegant accommodations for the commercial resident of the company. This gentleman has the superintendance of a considerable manufacture of silk, for which Cossimbazar has long been famous. The place is also noted for its stockings, which are knitted with wires, and are esteemed the best in Bengal. The price is from 20 to 35 rupees for the "Corge," which consists of 20 pairs. This village, according to Tavernier's account, sends abroad every year 22 thousand bales of silk, weighing each 100 lbs.; making in all 2,200,000 lbs. of 16 oz. each. Although this statement is probably exaggerated, yet the quantity of silk consumed by the natives in carpets, sattins, and other stuffs, must have been very great. The soil of this district is not only rich, but it is the best in the country. Crops of every sort are very luxuriant; and Cossimbazar has obtained the name of the garden of Bengal, which itself has long had the appellation of the garden of India.

COSSIMCOTTA, a town of Hindoostan, in the circar of Cicacole; 61 miles S.W. of Cicacole.

COSSIN, **COQUIN**, or **CAUQUIN**, **LOUIS**, in *Biography*, an engraver, born about the year 1633, at Troyes, in Normandy. In 1690 we find him at Paris, where he styled himself *engraver to the king*. We have a few portraits by this artist, and amongst others a head of Louis XV. as large as life. Strutt. Heineken. Costa.

COSSINGTON, in *Geography*, a rectory in Leicestershire, in the hundred of East Goscote; in this parish the junction

of the Leicester and Melton Mowbray navigation with the Leicestershire navigation takes place, at a spot called-Turn-water-meadow. See **CANAL**. This village is situate upon the stratum of red-earth, and has the out-crop of the famous blue-line lime-stone about one or two miles to the north-west of it.

COSSINIA, in *Botany*, (named by Commerfon in honour of M. de Cossigni, a skilful naturalist and zealous cultivator of plants in the Isle de France.) Lam. Enc. Willd. 675. Juss. 248. Class and order, *hexandria monogynia*. Nat. Ord. *Sapindi*, Juss.

Gen. Ch. *Cal.* one-leafed, permanent, deeply divided into five segments, reflexed under the ripe fruit. *Cor.* Petals four or five, egg-shaped, slightly unguiculated, inserted into the receptacle, expanding, longer than the calyx. *Stam.* Filaments six, bristle shaped, about the length of the petals; anthers oval-oblong. *Pist.* Germ superior, roundish, obtusely trigonous; style simple, short; stigma truncated. *Peric.* Capsule egg-shaped, inflated, trigonous, three-celled, six-valved. *Seeds* two or three in each cell, globular, blackish, affixed to a central receptacle.

Ess. Ch. Calyx inferior, five-cleft. Corolla four or five-petalled. Capsule three-celled, dehiscent at the apex; cells with two or three seeds.

Sp. C. *triphylla*. Lam. 1. Willd. 1. "Leaves ternate; leaflets oblong, obtuse." A shrub, six or eight feet high; branches cylindrical, tomentous towards the summit. *Leaves* alternate, on a rather long petiole; leaflets narrowed towards the base, green, and somewhat scabrous above, tomentous and brownish-white underneath; the terminal one a fourth longer than the two lateral ones. *Flowers* of a moderate size, white, in lateral and terminal racemes which all together form a panicle; petals four. Calyxes, peduncles, and petioles tomentous. A native of the Isle of Bourbon, found by Commerfon on the summit of mount Rempart. 2. C. *pinnata*. Lam. 2. Ill. Pl. 256. Willd. 2. "Leaves pinnated; leaflets five or seven, lanceolate, emarginate." A shrub, in habit resembling the preceding. *Leaflets* green, nearly naked, and a little scabrous above, tomentous and whitish underneath. Petioles, peduncles, and the summit of the branches clothed with a short russet down. *Flowers* white, in small axillary and terminal panicles; calyx tomentous; petals five, caducous; stamens longer than the petals. *Capsules* tomentous. A native of the Isle of France.

COSSINITES, in *Ancient Geography*, a river of Thrace, which ran through the territory of Abdera, and discharged itself into the Bistonie lake.

COSSIPOUR, in *Geography*, a town of India, in the country of Almora; 28 miles N. of Rampour.

COSSIUM, or **COSSIO**, in *Ancient Geography*, a town of Gallia Aquitania, in the country and the capital of the Vafates, according to Ptolemy; now *Bazax*.

COSSLIN, anciently **COSSALITZ** and **COSSALIN**, a neat town of Prussia, in the duchy of Pomerania; seated on the river Nisebach, about a league from the Baltic. The market-place is a large well built square, in the centre of which is a statue of Frederic William I. king of Prussia, erected in the year 1724, in grateful commemoration of his having rebuilt the town, which six years before had been consumed by a dreadful conflagration. Cosslin is the seat of a court of justice, and has some manufactures. N. lat. 54° 9'. E. long. 16° 7'.

COSSOANUS, called by Pliny *Cossoagus*, in *Ancient Geography*, a river of India, which, according to Arrian, discharged itself into the Ganges.

COSSONEY, a town of Switzerland, in the canton of Bern, built in the year 442; at one time a large town, but now reduced; 8 miles N.W. of Nion.

COSSUS, in *Ancient Geography*, a mountain of Asia Minor, in Bithynia. Steph. Byz.

COSSYRA, or COSYRUS, a small island in the African sea, which some authors refer to Sicily; but Strabo makes it a part of the proper territory of Carthage. According to Ptolemy, it had a city of the same name, which, by reason of its vicinity to Carthage, was without doubt a place of some repute. Scylax tells us it was only a day's sail from Lilybæum in Sicily; and Strabo places it in the middle of the African sea, at an equal distance from Lilybæum and Clypea, a city of Africa Propria. From four antique coins exhibited by Paruta and Lucas Holstenius, it appears, that Cossyra was the name most frequently used; though Mela and Pliny call it *Cofura*. According to Strabo, this island was 150 stadia in circumference. It is thought to be the present isle of *Pandataria*.

COST, in *Heraldry*, a subdivision of the bend, containing in breadth the half of a bendlet.

COSTA, GEORGE DA, in *Biography*, a native of Portugal, descended from low parents, but by his talents and industry attained to great rank and wealth in the church. After he had risen to an archbishopric, his sovereign Alphonus V. sent him as ambassador to the king of Castile; made him prime minister, and obtained for him a cardinal's hat. Elevated so much above his contemporaries, he became an object of envy, and to avoid the persecution of his enemies he withdrew to Rome, in 1480, where he was entrusted with many concerns of high importance as well to the state in which he sought protection, as to that from whence he had fled. In 1495, on the accession of Emanuel, he was invited back to Portugal with the offer of presiding in the royal councils; but his advanced state of life forbade him to undertake so long a journey, and so hazardous an employment; he remained at Rome, where he died in 1508, having passed his hundredth year. He was a singular instance of an almost unparalleled accumulation of ecclesiastical benefices and dignities on any one individual, having filled eight bishoprics; two archbishoprics; and occupied a still greater number of deaneries, and other rich preferments. Moreri.

COSTA, LORENZO, a Ferrarese painter of considerable eminence, who flourished towards the end of the fifteenth and at the commencement of the sixteenth centuries. The period of his birth is unknown. He was employed at Ferrara, in the early part of his life, upon many considerable works both public and private: the choir of the church of the Dominicans, long since destroyed, was painted by him with great skill and diligence. The reputation which he acquired by these and his other works at Ravenna, occasioned his being employed by the family of Bentivoglio, at Bologna, to paint in their chapel at San Petronio, several pictures in concurrence with Francesco Francia, the most celebrated Bolognese artist of his time: one of these, in which are introduced several admirable portraits, is dated 1488. The latter part of his life was spent at Mantua, where, after the death of Mantegna, he was considered the first painter. One of his altar pieces painted in 1505, in the chapel of the duke, is particularly worthy of notice. He has by some authors been considered the disciple of Francia; but this opinion is combated by Lanzi, who doubts the inscription on which it is founded, and supposes Costa rather to have been indebted to the studies, which, when young, he made from the works of

Lippi Gozzoli and other Florentine painters. He died at Mantua about the year 1530.

His descendants, Ippolito, Luigi, and Lorenzo Costa, made no despicable figure in the school of painting at a later period. Lanzi. Stor. Pittor.

COSTA, in *Botany*, is used indifferently with *nervus* for the longitudinal rib or nerve of a leaf. See *NERVUS*. It is most frequently present in leaves in general, especially in plants of the same natural order, mosses, however, and *Fuci* being uncertain in this respect. In the greater number of leaves the rib is solitary, running from their base or foot-stalk to the summit or point. Such leaves as are destitute of it are termed *enervia*, not *ecostata*; such only as have more than one rib are called *nervoſa*. See *COSTATUM*.

Leaves furnished with three ribs, all originating at the base, whether such ribs all proceed to the point, or vanish, as often happens to the lateral ones, before they reach it, are called *trinervia*; when the lateral ribs branch off from the middle one at some distance above the base, leaves so constructed are termed *triplinervia*. When the two lateral ribs not only originate from the bottom of the other, but run, moreover, along the very edge of the leaf, for a certain space, appearing sometimes as if the base of the leaf had been cut away to the lower part of these lateral ribs, such a leaf is defined *laſi trinerve*, three-ribbed at the base; as is seen in the Burdock, *Ardium Lappa*, and also in *Serophularia nodosa*, for which last plant it affords an excellent specific character. Linnæus at one period expressed this mark by the words *folia laſi tranſverſa*. See *Fl. Suec.* n. 560.

Hedwig has chosen to contrive the term *duſulorum ſaſciculus*, a cluster of vessels, to express the *coſta* of mosses, which is altogether superfluous, though undoubtedly correct. Every nerve and vein of all leaves is indeed a cluster of vessels, or the channel or sheath along which such vessels run; yet nothing but inconvenience is occasioned by the introduction of a new and compound term, in place of a simple one already well understood. It seems most commodious to use *coſta* exclusively for the central or main rib, common to leaves in general, and *nervi* for the lateral ones, when present, which practice has generally prevailed. The veins are sent off, here and there, from both *coſta* and *nervi*, being subordinate ramifications, or clusters of vessels, for the transmission of fluids. There is every reason to believe that each rib and vein is furnished with adducent as well as reducent vessels, serving therefore to convey the vegetable fluids in both directions; at least nothing decisive of the contrary has ever been detected. S.

COSTA *Balconæ*, in *Ancient Geography*, a place of Italy, on the coast of Liguria, according to the Itinerary of Antonine, who marks it between Lucus Bormanni, and Albinthimium.

COSTA *Rica*, in *Geography*, the most southern province of Guatemala in Mexico, bounded on the N. by Nicaragua, on the E. by the Spanish main, on the S. E. by the province of Veragua, and on the W. and S.W. by the Pacific ocean; 50 leagues in length and nearly as many in breadth. It is mountainous, abounding with deserts and forests; thinly peopled and ill cultivated; the inhabitants live, for the most part, independently of the Spaniards. It derives its name from its rich mines of gold and silver: one at Tisingal having been reputed another Potosi. It produces excellent cacao or chocolate. Besides, its principal commerce consists in cattle, hides, honey, and wax. Its capital is Cartago. On the Pacific it has a large port, or rather small bay, called Nicoya, or the gulf de las Salinas, noted

noted for the pearl fishery, and for the shell-fish which dyes purple; while in the Atlantic is the port called that of Cartago, though at a great distance from the town.

COSTÆ, in *Anatomy*. See *RIBS*.

COSTANZI, PLACIDO, in *Biography*, a painter born at Rome about the year 1688. A certain delicacy of style distinguishes the works of this master. There is a picture of his in the church of Santa Maddalena at Rome, representing St. Camillo with angels, in which the figures are so graceful, that he seems successfully to have imitated Domenichino. His paintings in fresco are much admired, of which a vault in the church of Sta. Maria in Campo Marzio is the most considerable. He died at the age of 71. Lanzi.

CONSTANZO, ANGELO DE, descended from a Neapolitan family of distinction, was born in 1507. He gave himself up to literary pursuits, and was employed more than 40 years in compiling a history of his own country, entitled "Historie del Regno di Napoli," which comprehended the events of about 240 years, *viz.* from 1250 to 1489, and is regarded as the best history of that kingdom. It has been republished; but Constanzo was more celebrated as a poet; he wrote the best sonnets of his time, and there have been many editions of his poetical pieces. The exact period of his death is not known; but there is a letter extant written by him in 1591. He was married and had two sons, both of whom died very young. Moreri.

COSTARD, GEORGE, a learned clergyman of the church of England, was born about the year 1710. He was entered at Wadham college, Oxford, where, in 1733, he took the degree of M.A. and became tutor, and afterwards fellow of his college. His first occupation in the church was derived from the curacy of Islip in Oxfordshire. No professional duties however in the course of his life prevented him from the pursuits of literature. Before he had obtained a curacy he gave an honourable testimony to his diligence in the study of the Oriental tongues by the publication of "Critical Observations on the Psalms;" and in 1746 he addressed a letter to Martin Folkes, esq. president of the Royal Society, concerning the progress of astronomy among the ancients. The object of Mr. Costard was to prove that the science of astronomy is to be traced to the Greeks only, after they had applied geometry to the heavens. The next work published by this ingenious gentleman, was "Observations tending to illustrate the Book of Job," to which as the proper date, he assigns the period of the Jewish captivity at Babylon. In 1748 he published "A farther account of the rise and progress of Astronomy among the Ancients, in three letters" to Mr. Folkes. We have after this, several works printed separately, or among the Transactions of the Royal Society, which exhibit the learning and critical powers of Mr. Costard. The reputation which he acquired for literature introduced him to the notice of the lord chancellor Northampton, who, as a reward of real merit, presented him in 1764 with the vicarage of Twickenham in Middlesex, where he spent the remainder of his life. In the same year he published the "Use of Astronomy in History and Chronology, occasionally exemplified by the Globes;" this work was printed in a thin quarto, and has been regarded as of considerable use to young people who have already made some proficiency in the elements of the science. It has been since reprinted in the 8vo size. Mr. Costard's next work was entitled "Astronomical and Philosophical Conjectures on a Passage in Homer." He then engaged in a correspondence with the late learned Jacob

Bryant on the subject of the land of Goshen, which has been printed in Mr. Bowyer's "Miscellaneous Tracts." Another, and the last publication of this gentleman, was on the Antiquity of the Gentoo Code, in a letter to Nathaniel Brassey Halhed, esq., a gentleman distinguished for his great learning, but who in the year 1794 was found among the adherents of Brothers, since confined in a receptacle for lunatics. Mr. Costard died in 1782 highly respected for his learning, and greatly beloved on account of the general benevolence and kindness of his private character. Biog. Brit.

COSTARUM DEPRESSORES PROPRII, in *Anatomy*, a name given by Douglas, from Cowper, to what Albinus affirms to be only that part of the internal intercostal muscles which lie nearest the ribs.

COSTARUM Levatores. See *LEVATORES*.

COSTATUM FOLIUM, in *Botany*, ribbed, ought perhaps strictly to be confined to a leaf furnished with one central rib, in opposition to such as have either no longitudinal rib or nerve at all, or no principal one, the term *nervosum* being reserved for leaves that have more than one. Linnæus however has incautiously applied the term in question to the leaves of *Echites sphyllitica*, which he describes in his manuscript *alternatim costata*, and in his *Supplementum*, p. 167, published and partly written by his son, *venoso-costata*, meaning that the lateral veins, which branch off horizontally from the midrib, are conspicuous and somewhat permanent; a sense no one could have understood without a reference to the original authority. It would however be a very intelligible sense of the word, such veins, (as may be seen less distinctly in *Canna*.) bearing a great resemblance to the ribs, *costæ*, of an animal, ranged parallel to each other along the spine; but it would be a new meaning, hitherto, we believe, unauthorized, and differing from what is generally adopted and understood. If this last sense must, nevertheless, be admitted, the word *uninerve* will very well supply the place of *costatum* for a single-ribbed leaf, as *nervosum* at present does for one with several longitudinal ribs. S.

COSTEENING. See *MINERALOGY*.

COSTER, JOHNSON, LAURENCE, in *Biography*, is said to have lived at Haarlem early in the 15th century, and to have been the first inventor of the art of engraving on wood, which gave rise to that of printing. The anxiety of the Dutch to shew that their country gave birth to the noble art of printing may have produced many improbable stories concerning this man. It is said that, walking in a wood near Haarlem, he amused himself by cutting letters upon the bark of a tree, which he impressed upon paper. Improving this incident, he proceeded to cut single letters upon wood, and uniting them by means of thread, he printed a line or two for his children. It is added, that he afterwards printed a book, entitled, "Speculum Salvationis;" but baron Heineken, who has minutely investigated the whole story, considers it as not entitled to the least credit; and pronounces the prints, attributed to Coster, to be the works of a later date. Amongst these prints are the following: A small bust of a man, with a cap, near 2 inches high, and 1 in breadth, marked **Laurence Jassoen**, supposed to be the portrait of Coster; a bust of an old man in profile, 2 inches high by 1½ wide, marked at bottom **Walckart Scil da Harleim**; another bust, the face turned to the left; another, a three-quarter face; and in the royal library of St. James's is a Virgin, with the instruments of Christ's sufferings, attributed to Coster. He is said to have died in 1441.

COSTERA, in *Geography*, a town of France, in the

island of Corsica, in the department of Golo, district of Bastia. It is the chief place of a canton, and has 1338 inhabitants.

COSTHEIM, or **KOSTHEIM**, a town of Germany, in the circle of the Lower Rhine, and electorate of Mentz, situated on an island in the Rhine, near the mouth of the Maine, on the side of the river opposite to Mentz, about a mile to the east.

COSTIGLIOLE, a town of France, in the department of Tanaro, which was formerly part of Piedmont in Italy. It is the chief place of a canton in the district of Aili, and has 4489 inhabitants. The canton contains 7 communes, and a population of 12,740 individuals.—Also, a town of France, in the department of Stube, which likewise formed a part of Piedmont in Italy; but this Costigliole has only 2000 inhabitants, and the canton, of which it is the chief place, counts but 4 communes, and 4923 inhabitants.

COSTIVENESS, in *Medicine*. See **CONSTIPATION**.

COSTIVENESS, in *Infants*. See **INFANT**.

COSTIVENESS, in *Ferriery*, is also a disease to which horses are subject, from violent exercise, or the want of exercise, and long feeding on hard meat. An opening diet, and lenitive mild purges, as of Glauber's salts, with lenitive electuary, four ounces of each dissolved in warm ale or water, repeated every other day, and scalded bran, are recommended. But a natural or habitual costiveness, which is not uncommon, is not so easily removed. In this case the following purge is recommended; viz. succotrine aloes six drams, spermaceti half an ounce, fenugreek seed in powder two ounces; the whole is to be made into two balls, with a sufficient quantity of honey or treacle, and given to the horse in a morning fasting. Scalded barley should also be used instead of bran, and the liquor given milk-warm for his drink. The above purge should be repeated once in four days, till he has taken six doses. Gibson's Ferriery, vol. ii. p. 134.

COSTMARY, in *Botany*. See **TANACETUM Balsamita**.

COSTOBOCI, in *Ancient Geography*, a people of European Sarmatia; called also Costobocæ by Ammianus Marcellinus, and Costoboci by Ptolemy.

COSTOTOTL, in *Ornithology*, the New Spain Oriole of Latham, and **ORIOLEUS Costototl** of Gmelin, which see.

COSTOW, or **COSTWAY**, in *Geography*, a river of England, which falls into the Derwent, 2 miles N. of New Malton, in the east riding of the county of York.

COSTS, in *Law*, are *expense litis*, incurred in the prosecution and defence of actions, and consisting of money paid to the king and government for fines and stamp duties, to the officers of the court, to the counsel and attorneys for their fees, &c. These costs may be considered either as between attorney and client, payable by the latter to the former, whether he ultimately succeed or not; or as between party and party, being only those which are allowed, in some particular cases, to the party succeeding against his adversary. Between party and party they are either *interlocutory* or *final*; the former being given on various interlocutory motions and proceedings, in the course of the suit; and the latter, to which the term *costs* is most generally applied, being such as are not allowed till the conclusion of the suit.

Although it is now a maxim of ours as well as of the civil law, that "victus victori in expensis condemnandus est," the common law did not professedly allow any; the amercement of the vanquished party being his only punishment. The first statute which gave costs, under that title, to the

demandant in a real action, was the statute of Gloucester (6 Edw. I. c. 1.); as did the statute of Maribridge, (52 Hen. III. c. 6.) to the defendant:—though in reality costs were always considered and included in the *quantum* of damages, in such actions where damages are given; and, even now, costs for the plaintiff are always entered on the roll as increase of damages by the court. But, because these damages were frequently inadequate to the plaintiff's expences, the statute of Gloucester orders costs to be also added; and farther directs, that the same rule shall also hold place in all cases where the party is to recover damages. And therefore in such actions, where no damages were then recoverable, (as in *quare impedit*, in which damages were not given till the statute of Westm. 2. (13 Edw. I.) no costs are now allowed (10 Rep. 116.), unless they have been expressly given by some subsequent statute. The statute (3 Hen. VII. c. 10.) was the first which allowed any costs in a writ of error. But no costs were allowed the defendant in any shape, till the statutes 23 Hen. VIII. c. 15. 4 Jac. I. c. 3. 8 & 9 W. III. c. 11. and 4 & 5 Ann. c. 16.; which very equitably gave the defendant, if he prevailed, the same costs as the plaintiff would have had, in case he had recovered. When the plaintiff recovers single damages, he is entitled only to single costs; unless more be expressly given by statute. But if double or treble damages be given by statute, in a case wherein single damages were before recoverable, the plaintiff is entitled to double or treble costs, although the statute be silent respecting them (Say. Costs 228.); as in an action upon stat. 2 Hen. IV. c. 11, &c. In some cases double and treble costs are expressly given to the plaintiff; as upon the game laws, by stat. 2 Geo. III. c. 19. § 5. And wherever a plaintiff is entitled to double or treble costs, the costs given by the court *de incremento* are to be doubled or trebled, as well as those given by the jury. (2 Leon. 52. Cro. Eliz. 582. 3 Lev. 351. Carth. 297. 322. 2 Str. 1048.; but see 1 Term. Rep. 252.) However, double or treble costs are not understood to mean, according to their literal import, twice or thrice the amount of single costs. Where a statute gives double costs, they are calculated thus: 1. The common costs, and then half the common costs. If treble costs: 1. The common costs; 2. Half of these; and then half of the latter. Double or treble costs are in some cases expressly given to the defendant; as in actions against parish-officers, by stat. 43 Eliz. c. 2. § 19;—against justices of the peace, constables, &c. by stat. 7 Jac. I. c. 5;—for distresses for rents and services, by stat. 11 Geo. II. c. 19. § 21. 2;—and against officers of the excise or customs, by stat. 23 Geo. III. c. 70. § 34. 24 Geo. III. sess. 2. c. 47. § 35.

The king, and any person suing to his use, (stat. 24 Hen. VIII. c. 8.) shall neither pay nor receive costs; and the queen-consort participates the same privilege. In two other cases also an exemption lies from paying costs. Executors and administrators, when suing in the right of the deceased, shall pay none (Cro. Jac. 229. 1 Vent. 92.); for the statute 23 Hen. VIII. c. 15. doth not give costs to defendants, unless where the action suppoeth the contract to be made with, or the wrong to be done to, the plaintiff himself. And paupers, that is, such as will swear themselves not worth five pounds, are, by statute 11 Hen. VII. c. 12. to have original writs and subpoenas *gratis*, and counsel and attorney assigned them without fee; and are excused from paying costs, when plaintiffs, by the statute 23 Hen. VIII. c. 15.; but shall suffer other punishment at the discretion of the judges. And it was formerly usual to give

such

such paupers, if non-suited, their election either to be whipped or pay the costs (1 Sid. 261. 7 Mod. 114.); though that practice is now disused (Salk. 506.). It seems, however, agreed, that a pauper may recover costs, though he pays none; for the counsel and clerks are bound to give their labour to *him*, but not to his antagonists. (1 Equ. Caf. Abr. 125.)

To prevent trifling and malicious actions, for words, for assault and battery, and for trespasss, it is enacted by statutes 43 Eliz. c. 6. 21 Jac. I. c. 16. and 22 & 23 Car. II. c. 9. § 136. that, where the jury who try any of these actions shall give less damages than 40*s.*, the plaintiff shall be allowed no more costs than damages, unless the judge, before whom the cause is tried, shall certify under his hand on the back of the record, that an actual battery (and not an assault only) was proved, or that in trespasss the freehold or title of the land came chiefly in question. This statute does not extend to actions of debt, covenant, assumpsit, trover, or the like (3 Keb. 31. 1 Salk. 208.); or to actions for a mere assault (3 T. R. 391.); or for criminal conversations (3 Will. 319.); or battery of the plaintiff's servant (3 Keb. 184. 1 Salk. 208. 1 Stra. 192.) In all these cases, though the damages be under 40*s.*, the plaintiff is entitled to full costs without a certificate. Also, by statute 4 & 5 W. & M. c. 23. and 8 & 9 W. III. c. 11. if the trespass were committed in hunting or sporting by an inferior tradesman, or if it appear to be wilfully and maliciously committed, the plaintiff shall have full costs, though his, as assessed by the jury, amount to less than 40*s.* The legislature has also been obliged to interfere still further, to guard against trifling and vexatious actions, by means of what are commonly called the "Court of Conscience Acts;" such are statutes 3 Jac. I. c. 15. § 4. 14 Geo. II. c. 10. which provide, that if an action be brought for less than 40*s.* against a defendant living in London, and liable to the jurisdiction of the Court of Requests there, the plaintiff shall not recover any costs, but shall pay them to the defendant. See *COURT of Conscience*. None of the statutes, made for restraining the plaintiff's right to costs, extend to actions brought in an inferior court, and removed by the defendant into a superior court (2 Lev. 124. 4 Mod. 378, 9. 1 Ld. Raym. 395.); and it has been holden, that stat. 21 Jac. I. c. 16. and stat. 22 & 23 Car. II. c. 9. only restrain the *court* from awarding more costs than damages; but the *jury*, not being restrained thereby, may give what costs they please.

Costs are taxed, as between party and party, by the master in the King's Bench, or by one of the prothonotaries in the Common Pleas, upon a bill made out by the attorney for the party entitled; or frequently, without a bill, upon a view of the proceedings; and if there have been any *extra-expences*, which do not appear on the face of the proceedings, there should be an affidavit made of such expences, to warrant the allowance of them, which is called an affidavit of *increased costs*. (Imp. K. B. 348.) Among fair practitioners, it is usual to give notice to the opposite attorney of the time when the costs are intended to be taxed. But for enforcing it, a rule is obtained from the clerk of the rules in the King's Bench, or one of the secondaries in the Common Pleas, which should be duly served; after which, if the costs are taxed without notice, the taxation is irregular, and the attorney liable to an attachment. The means of recovering costs, as between party and party, are by *action* or *execution*, upon a judgment obtained for them; or by *attachment*, upon a rule of court. There are also auxiliary means for the recovery of these costs, as by moving to stay the proceedings, until security be given for the payment of

costs; or until the costs are paid of a former action for the same cause; or by deducting the costs of one action from those of another. This practice of deducting, or setting off the costs, in one action against those in another, however agreeable to natural justice, does not seem to have obtained till lately in the court of K. B. (2 Stra. 891. 1203. Bull. N. P. 336. 4 Term. Rep. 124.) But in Common Pleas, it has been frequently allowed not only where the parties have been the same, but where they have been in some measure different. (Barnes 145. 2 Black. Rep. 826. Bull. N. P. 336.)

In cases between attorney and client, the former may maintain an action against the latter for the recovery of his costs. (Cro. Car. 159, 160.) But by stat. 3 Jac. I. c. 7. § 1. attorneys and solicitors must deliver a bill to their clients before bringing an action; and by stat. 2 Geo. II. c. 23. § 23, explained by stat. 12 Geo. II. c. 13, made perpetual by stat. 30 Geo. II. c. 19. § 75, no attorney nor solicitor shall commence any action till the expiration of one month after the delivery of his bill, subscribed with the attorney's hand. The said statute, 2 Geo. II. c. 23, also directs the mode of taxation of attorneys' bills by the officers of the several courts; and directs that if the bill taxed be less, by a sixth part, than the bill delivered, the attorney shall pay the costs of taxation; but if it shall not be less, the costs shall be in the discretion of the court. If the whole bill be for *conveyancing*, or for business done at the *quarter-sessions*, &c. it cannot be taxed. But where an attorney had delivered two separate bills, one for disbursements and fees in causes, and the other for making conveyances, a rule was made for taxing both. And so, when it was moved, that the master might be directed to tax those articles in an attorney's bill which related to conveyancing and parliamentary business, the rest being for management of causes in the court of King's Bench, lord Mansfield said, there was no doubt but the master might tax the whole. (Barnes C. B. 141. 2.; 4 Term. Rep. 124.; Say, Rep. 233.; Say, Costs 320.)

By 14 Geo. I. c. 17, if the plaintiff, who intended to try a cause, changes his word, and does not countermand the notice of trial given to the defendant six days before the trial, he shall be liable to pay costs to the defendant for not proceeding to trial.

Costs are allowed in *Chancery*, for failing to make answer to a bill exhibited, or making an insufficient answer: and if a first answer be certified by a master to be insufficient, the defendant is to pay 40*s.* costs; 3*l.* for a second insufficient answer; 4*l.* for a third, &c. But if the answer be reported good, the plaintiff shall pay the defendant 40*s.* costs. An answer is not to be filed (until when, it is not reputed an answer) until costs for contempt in not answering, are paid. If a plaintiff in chancery dismisses his bill, or the defendant dismisses the same for want of prosecution, costs are allowed, by stat. 4 and 5 Anne, c. 16. In other cases, it seems that the matter of costs to be given to either party is not, in equity, held to be a point of right, but merely discretionary, by the statute 17 Rich. II. c. 6., according to the circumstances of the case. Nevertheless, the statute 15 Hen. VI. c. 4., which requires surety to satisfy the party aggrieved his damages, in granting the subpoena, seems expressly to direct that as well damages as costs shall be given to the defendant, if wrongfully vexed in this court. In case of a great fraud, a person may be obliged to pay such costs as shall be ascertained by the injured party's oath. 2 Vern. 123.

COSTIUS, in *Rotary*, {*κοστος*, Theophr. Dioscor.) Linn.
N 2
gen.

gen. 3. Schreb. 4. Willd. 7. Juff. 63. Vent 2. 204. Roscoe Linn. Transf. vol. 8. 349. Clafs and order, *monandria monogynia*. Nat. Ord. *Scitamineæ*, Linn. Roscoe. *Canna*, Juff. *Drymyrrhiza*, Vent.

Gen. Ch. *Cal.* Perianth superior, trisid, shorter than the corolla. *Cor.* three-parted, nearly equal. Nectary petal-shaped, longer than the corolla. *Stam.* Filament petal-shaped, linear, flat, extending beyond the anther, terminating in an ovate-lanceolate apex (upper lip of the nectary; Swartz. Dryandr.) anther double, adnate longitudinally to the stamen. *Pist.* Style passing in a groove between the lobes of the anther; stigma capitate. *Peric.* Capsule three-celled, crowned with the permanent calyx, angular, opening at the angles. *Seeds* numerous.

Eff. Ch. Anther double. Filament elongated beyond the anther, ovate-lanceolate at the apex, flat. Capsule three-celled, dehiscent outwards. Seeds numerous. Roscoe.

Sp. 1. *C. speciosus*. Smith Linn. Transf. 1. 249. Willd. 3. Roscoe. 1. (*C. arabicus*; Mart. Jacq. Ic. rar. 1. 1. Collect. 1. 143. Swartz. Prod. 11. *Banksia speciosa*; Koenig. *Hellenia grandiflora*; Retz. obs. fasc. 6. 18. *Tsjana-kna*; Rheed. Mal. 11. 15. tab. 8? *Herba spiralis hirsuta*; Rumph. Amb. 6. 143. tab. 64. fig. 1. *Amomum hirsutum*; Lam. Ill. Pl. 3. Encyc. 6.) "Nectary obsoletely three-lobed, undulated, fringed; leaves silky-villous." Root two inches thick, knotty, creeping. *Stems* annual, three or four feet high, cylindrical, simple, fleshy, with a strong bark. *Leaves* about six inches long, and four broad, alternate, lanceolate, acuminate, coriaceous; green and smooth above; silky, soft and whitish underneath. *Flowers* in a terminal, nearly sessile, erect, close spike; bracts two at the base of each flower; outer one egg-shaped, acute, concave, coriaceous, broad, blood-red; the other oblong, only one-third of the breadth of the former, purple at the tip, embracing the flower; calyx, in the time of flowering, green, with a purple tip; on the fruit, blood-red; petal and nectary flesh-coloured, sometimes almost white; anthers white. A native of the East Indies. The root, according to La Marck, who received specimens from Commerfon, has a slight flavour of ginger. 2. *C. arabicus*. Linn. Sp. Pl. Hort. Clif. 2. Willd. 1. Roscoe 2. Rheed. hort. mal. n. tab. 8? "Nectary egg-shaped, quite entire; leaves smooth on both sides." Root perennial. A native of the East Indies. 3. *C. spicatus*. Mart. 3. Willd. 2. Rosc. 3. (*Alpinia spicata*; Jacq. 1. tab. 1. *Amomum petiolatum*; Lam. Enc. 7.) "Nectary undulated, somewhat trisid; leaves acuminate, quite entire, shining, attenuated at the base." Root perennial, fleshy, irregular, white. *Stems* several, nearly erect, leafy, smooth, somewhat jointed, from one to two feet high. *Leaves* alternate, oblong, smooth, on short cylindrical petioles. *Flowers* yellow, or without scent, in a terminal conical spike, with an involucre of three or four leaves at its base; bracts imbricated, coriaceous, bright red; corolla an inch long. A native of Martinico by the side of torrents. The inhabitants of Martinico make a decoction of the stem and root which they esteem a refreshing beverage, particularly salutary in gonorrhœa and other complaints. 4. *C. comosus*. Rosc. 4. (*Alpinia comosa*; Willd. Jacq. plant. rar. 2. tab. 202.) "Nectary thick, oblong, channelled, erect, five-toothed at the tip; leaves lanceolate, undulated, somewhat villous on both sides." Root perennial. *Stems* four feet high, simple, pubescent. *Leaves* sheathing. *Flowers* in a terminal spike; bracts numerous, red, ovate-lanceolate, longer than the flowers; calyx red; corolla yellow; nectary

yellow. A native of Caraccas in South America. 5. *C. spiralis*. Rosc. 5. (*Alpinia spiralis*; Jacq. hort. Schoenb. 1. tab. 1.) "Nectary concave, quite entire; leaves elongate-elliptical, coriaceous, shining."

In their natural habit, the species of this genus are distinguished from others of the same natural order, by their inclined and spiral stem, which is frequently hirsute, and sometimes frutescent. Roscoe.

The ancients cited the costus on account of the spicy quality of its root, but it is not easy to determine which of the scitamineous plants they called by that name. Dioscorides mentions three sorts. The best, says he, is the Arabian, which is white and light, and has a strong pleasant smell; the second is the Indian, which is thick, light, and dark-coloured; the third is the Syrian, which is heavy, with a box-coloured bark, and pungent smell. Pliny speaks of only two kinds, the white and the black. The Arabs, the later Greeks and the Latins, divide it also into two kinds, the sweet and the bitter, a distinction not known to the earlier Greek writers. La Marck conjectures that the costus of the ancients is no other than our ginger; but in this he is certainly wrong, for *Zingiber*, Zingiber, is separately described both by Dioscorides and Pliny, though it does not occur in Theophrastus.

Propagation and Culture.—These plants are propagated by parting the roots in the spring. They should be put into pots, filled with light kitchen-garden earth, and kept constantly in the tan-bed in the stove.

COSTUS hortenfis; Dalech. See *TANACETUM Balsamita*.

COSTUS Indicus, an American bark, called also *costus corticosus*, *costus corticus*, or *Winter's bark*. The islands of Madagascar, in Africa, of Domingo and Guadaloupe, in America, are the places where the most and best is found.

COSWICK, in *Geography*, a small town of Germany, in the principality of Anhalt Zerbst, with an old cattle pleasantly situated on the Elbe.

COSYRI, in *Ancient Geography*, a people of India, placed by Piny towards the Emodes mountains.

COSYTA, a town of Italy, in Umbria. Steph. Byz.

COTABAMBA, in *Geography*, a province or district of the vice-royalty of Peru, in South America, commencing S. E. of Cuzco, and at the distance of about 20 leagues, and extending above 30 leagues between the rivers Avancay and Apurimac, within which extent are various temperatures of air. This jurisdiction abounds in all kinds of cattle, and the temperate parts produce plenty of wheat, maize, and fruits. Here are also mines of silver and gold; the richness of which formerly rendered this province very flourishing; but their produce at present is greatly declined.

COTACE, in *Ancient Geography*, an ancient town of Asia, in Aria. Ptolemy.

COTACENA, or COTARZENA, a country of Asia, in Greater Armenia, in the vicinity of the Moschic mountains. Ptol.

COTÆA, a province of the Lesser Armenia. Ptol.

COTÆNA, a town of Lesser Armenia, in the præfecture of Muriana. Ptol.

COTAISIS, or CONTAISIS, a town of the Persians, in Asiatic Iberia, near the Phasis.

COTAMBA, a town of Persia Propria, according to Ptolemy.

COTANA,

COTANA, an episcopal city of Aſia, in Pamphilia Secunda.

CO-TANGENT, is the tangent of an arc, which is the complement of another arc to 90 degrees.

COTANTIN, or CONTANTIN, or *Colentin*, in *Geography*, a country of France, before the revolution, in Lower Normandy, including the towns of Coutances, Valogne, St. Sauveur, Cherbourg, Barfleur, Carentan, Ville Dieu, Granville, &c.

COTARII. See COSCEZ and COTERELLUS.

COTARINGEN, a town of the island of Borneo, on the south coast; 100 miles W. of Banjar-Massin.

COTATE, a town of India, in the province of Travancore: 14 miles S.E. of Travancore.

COTA-TENGA, a town of the island of Borneo; 30 miles N. of Banjar-Massin.

COTATUA, in *Ornithology*. See CALANGAY.

COTBUS and PEITZ, *the Circle of*, in *Geography*, in Lower Lufatia, anciently belonged to the kingdom of Bohemia, of which it was received as a fief by Frederick II. elector of Brandenburg, in 1641, and held as such till 1742, when Frederick the Great obtained its full and independent sovereignty and annexed it to the new mark of Brandenburg. But through the treaty of peace signed at Tilsit on the 7th of July, 1807, between France and Prussia, the circle of Cotbus was ceded to the new kingdom of Saxony by whose territory it had always been enclosed.

The extent of the circle of Cotbus is 17½ German square miles. It is irrigated by the river Spree, which yields abundance of good fish and especially very fine carps. Its soil is generally light and sandy, but in some parts extremely fertile; it abounds in iron ore, particularly near the villages of Burg and Werben. There are 2 towns and 116 villages, containing altogether 33,260 inhabitants, most of whom are the lineal descendants of the Vandals, and have retained the *Wendisch* language.

The town of Cotbus on the Spree, 72 miles S. of Berlin, contains 800 well built houses and 5000 inhabitants. It has still considerable breweries, and its beer, known by the name of *cotbus*, or *cotwitz*, had formerly a very extensive sale all over Germany. Cotbus has also a good linen trade and excellent woollen manufactures which were brought hither by protestant French refugees at the revocation of the edict of Nantes. The cloth that was made here in 1802, whilst it was a Prussian town, amounted to 368,000 Prussian dollars, or about 62,000*l.* sterling in value.

COTE, a term used in coursing, to express the advantage one greyhound has over another, when he runs by the side of it, and, putting before it, gives the hare a turn. See COURSING.

COTE-gare, a kind of refuse wool, so clung or clotted together, that it cannot be pulled asunder. By 13 Rich. II. stat. 1. c. 9. it is provided, that neither denizen nor foreigner make any other refuse of wools but cote-gare and *willain*. So the printed statute has it: but in the parliament-roll of that year, it is *cod land* and *willain*. *Cot*, or *cote*, signifies as much as cottage in many places, and was so used by the Saxons, according to Verstegan.

COTE, *La*, in *Geography*, a rich, populous, and beautiful district of Switzerland, in the Pays de Vaud; about 5 leagues in length, at a little distance from the lake of Geneva; celebrated for its wine, which bears the name of the district.—Also, an eminence of Mont Blanc, which overhangs the upper part of the glacier of Bosson.

COTE, *St. André*, a town of France, in the department of Iſere, with 3617 inhabitants. It is the chief place of a canton, which counts a population of 11,560 individuals in

thirteen communes, on a territorial extent of 137 kilometres and a half. La Côte St. André is situated about 21 miles west of Grenoble. It was formerly famous for its excellent cordials, known by the name of *Eaux de la Côte*.

COTE d'Or, *the Department of the*, is the first department of the fourth or eastern region of France. It consists of those parts of Burgundy, which, before the French revolution of 1789, were called *le Pays de la Montagne*, *l'Auxois*, and *le Dijonnais*. Its chief place is Dijon. It derives its name from a chain of hills extending south-eastwards from Dijon beyond Châlons sur Saône as far as Macon, called the *Golden Coast*, because it yields that excellent wine, known by the general appellation of Burgundy, the production of which is more profitable to France than the richest wine. In 1806 the Côte d'Or produced 322,842 pipes of wine, of which the district of Beaune alone furnished almost half, viz. 143,243 pipes.

The department of the Côte d'Or is bounded to the north by the department of Aube; to the N. E. by that of the Upper Marne; to the S. E. by the departments of the Upper Saône and of the Jura; to the south by that of Saône and Loire; and to the west by the departments of the Nièvre and of the Yonne. Its principal rivers are the Seine, which has its source here; the Saône, Onche, Tille, &c. The soil, in general, is bad and overgrown with weeds; there are however some fertile plains, especially in the district of Dijon, which yield abundant crops of corn and hay. Yet its wine and iron-mines constitute its principal riches. The climate is temperate and the air salubrious.

The whole department is divided into four districts, 35 cantons, and 733 communes. Its principal towns are Dijon, Chatillon, Semur, Beaune, Auxonne, and Nuits. The territorial extent is 8769½ kilometres, or 870,956 hectares, 207,600 of which are forests. It has a population of 347,842 individuals, or 781 inhabitants to the square league. Their annual contribution in taxes amount to 3,905,657 French livres, or nearly 10*s.* sterling for each individual.

COTE d'Or, *the Canal of the*, formerly known by the name of *Canal of Burgundy* in France, is 250 kilometres long, and forms a communication between the rivers Saône and Yonne. It had been projected by Hen. IV. of France. See CANAL.

COTE rotie is the name given to a chain of hills in France, in the department of Rhône, formerly part of the Lyonnais, which produces excellent wine.

COTES du Nord, *the Department of the*, is the eighth department of the ninth or north-west region of France, and comprises part of the province, which, before the French revolution of 1789, was called Upper Brittany. It derives its name from the whole of its northern frontier being washed by the British channel. Its chief place is Saint Brienc. It is bounded to the north by the British Channel; to the east by the department of Ille and Vilaine; to the south by that of Morbihan, and to the west by that of Finistère.

The principal rivers which irrigate this department are the Guet, Treguier, Trieux, Argueron, Ranxe, Lic, Oust, Blavet, &c. It has large tracts of heaths. The soil is not very fertile; yet it produces corn, especially Indian or Turkey corn, hemp, and flax. The orchards abound with apples, which are converted into cyder. The pastures are very good; the cattle and the horses in particular are much esteemed for their strength. There are also some iron and lead mines.

The department of the Côtes du Nord is divided into five districts, 47 cantons, and 376 communes. Its principal towns

towns are St. Brieuc, Loudéac, Dinan, Guingamp, Lanion, Plestin, Plouaret.

The territorial extent is 7357 kilometres or 736,720 hectares, (23,876 of which are forests,) with a population of about 1416 inhabitants for each square league, or 499,927 individuals for the whole department, whose annual contribution in taxes amounts to 2,549,791 French livres, or about 5s. sterling a head.

COTEA, in *Ancient Geography*, a country of Asia, in Greater Armenia, according to Ptolemy, who placed it to the east of the sources of the Tigris.

COTEAUX, LES, in *Geography*, a town on the road from Tiburon to port Salut, on the S. side of the S. peninsula of the island of St. Domingo; 13½ leagues E. by S. of the former, and 4 N.W. of the latter. N. lat. 18° 12'.

COTECHNEY, a river of America, in the state of North Carolina, which runs into the Nuse; 20 miles W. of Newbern.

COTELERIUS, JOHN BAPTIST, in *Biography*, a learned French author, born at Nîmes, in Languedoc, in the year 1628. By 12 years of age he had made great progress in the learned languages, and in mathematical studies. He became a student in the college of Sorbonne, where he took his degrees, and, in 1649, he was elected fellow. In this situation his application to study was almost incessant: the turn of his mind was to ecclesiastical antiquities, and the works of the Greek fathers. As a writer he was first known as the editor of some of the Homilies of St. Chrysofom, and of his Commentary on Daniel. In 1667, he was associated with M. du Cange, by order of the celebrated Colbert, in the task of examining and forming a catalogue and summary of the Greek MSS. in the king's library. In 1672, he published an edition of the Fathers, with notes, in 2 vols. folio, which was reprinted, in 1698, by Le Clerc; and has since been republished in Holland. In 1676 he was appointed professor of the Greek language in the Royal College of France; and about the same time was published the first volume of a work, entitled "Ecclesiæ Græcæ Monumenta" Gr. et Lat. 4to. Two other volumes were published in 1681 and 1686. To this great labour he fell a sacrifice, and died soon after the publication of the third volume. He left behind him 9 volumes of MSS. which were deposited in the king's library. Cotelerius was highly esteemed by his contemporaries: he was a man of great learning: his integrity was as great as his learning was extensive; and his manners were simple and unaffected. Moreri.

COTEMUL, in *Geography*, a town of the island of Ceylon; 20 miles S. of Candy.

COTENOPOLIS, in *Ancient Geography*, an episcopal town of Egypt.

COTENORUM, an episcopal see of Asia, in Pamphylia.

COTENSII, a people of Dacia. Ptolemy.

CONTENTIN, LE, in *Geography*, was formerly a subdivision of Lower Normandy, in France, whose inhabitants were advantageously known by their ingenuity and industry. Coutances was its chief place. It now forms part of the department of the Manche, has excellent pastures, and produces the best horses in Normandy.

COTERELLUS, COTARIUS, and *Coterellus*, according to Spelman and Du Fresne, are servile tenants: but in Domesday, and other ancient MSS., there appears a distinction, as well in their tenure and quality, as in their name. For the *cotarius* hath a free socage tenure, and paid a stated sum or rent in provisions or money, with some

occasional customary services: whereas the *coterellus* seems to have held in mere villenage, and his person, issue, and goods, were disposable at the pleasure of the lord. See COSCEZ.

COTERIE, a term adopted from the French trading associations or partnerships, where each person advances his quota of stock, and receives his proportion of gain; and which retains its original meaning when applied to little assemblies or companies associated for mirth and good humour; where each one furnishes his quota of pleasure, here they coin new words not understood elsewhere, but which it becomes fashionable for others to use; and they are thought ridiculous who are ignorant of them. It has been used of late to signify a club of ladies.

COTES, ROGER, in *Biography*, the son of the reverend Mr. Robert Cotes, rector of Burbage, in Leicestershire, was born there July 10th, 1682, and received the early parts of his education at Leicester school, where, when he was but eleven years of age, he shewed a strong inclination to the mathematics, which was encouraged by his uncle Dr. John Smith, who took him to his own house, and superintended his studies. Here he acquired the elementary part of those studies, for which he was afterwards so highly celebrated. From thence he removed to London, and was sent to St. Paul's school, where he made a very unusual progress in classical learning, though he never abandoned his favourite pursuits in mathematics. He seems also to have paid some attention to metaphysics, moral philosophy, and theology. In April 1699, when he was seventeen years of age, he was admitted pensioner of Trinity-college, Cambridge, and in 1705 was chosen fellow of that college; at this time he was private tutor to the earl of Harold and his brother, the sons of the then marquis, after duke of Kent. In the following January he was appointed professor of astronomy, and experimental philosophy upon the foundation made by Dr. Piume. For this office Mr. Cotes was not the only candidate, yet the votes were unanimously in his behalf. At the election, Mr. Whiston, who had considerable influence on the occasion, said, that he pretended himself to be not much inferior to Dr. Harris, the other candidate's master, but he confessed that he was but a child to Mr. Cotes, who, it must be remembered, was then only in his 24th year. In 1706 he took his degree of master of arts, and in 1713 he entered into holy orders, and almost immediately, at the desire of Dr. Bentley, published a new edition of sir Isaac Newton's Principia, to which he prefixed a preface. This added not a little to the high reputation that he had already obtained, and he was now regarded as one of the first characters of the age. In the Philosophical Transactions, he gave a description of the meteor that was seen March 6th, 1715-6. These were the only works that he published during his life, but after his death some other tracts of great merit were presented to the world by his relation, Dr. Robert Smith: these were (1.) the "Harmonia Mensurarum, sive analysis et synthesis per rationum angularum mensuras promotæ: accedunt alia opuscula mathematica: per Rogerum Cotefum. Edidit et auxit Robertus Smith, &c." (2.) "Hydrostatical and Pneumatical Lectures," a work of great merit, and which has been much read and highly approved. Mr. Cotes died June 5, 1716, to the great regret of his friends, and to the mathematical world in particular, in the prime of life, or indeed before he had reached that period, being only in his 33d year. He was interred in the chapel of Trinity-college, Cambridge, and to his memory Dr. Bentley wrote an excellent inscription in Latin. Mr. Whiston joined Mr. Cotes in giving a course of lectures on experimental philosophy,

among these were 24 on hydrostatics and pneumatics, of which each took 12. Mr Whiston esteemed his own to be so far inferior to those of Mr. Cotes, that he could not be prevailed on to publish them. The early death of Mr Cotes has ever been esteemed by mathematicians a public calamity: Newton himself asserted, that had he been spared, he would have proved one of the greatest men that ever lived. Biog. Brit.

COTESIAN THEOREM, in *Geometry*, an appellation used for an elegant property of the circle discovered by Mr. Cotes. The theorem is:

If the factors of the binomial $a^\lambda + x^\lambda$ be required, the index λ being any integer: let the circumference A B C D, (*Plate II. Analysis, fig. 21 and 22.*) the centre of which is O, be divided into as many equal parts as there are units in 2λ : and from all the divisions let there be drawn to any Point P in the radius OA, produced if necessary, the right lines AP, BP, CP, DP, EP, FP, &c. then supposing $OA = a$, $OP = x$, the product of all the lines AP, CP, EP, &c. taken from the alternate divisions throughout the whole circumference, will be equal to $a^\lambda - x^\lambda$, or $x^\lambda - a^\lambda$, according as the point P is within or without the circle; and the product of the rest of the lines BP, DP, FP, in the remaining alternate places, will be equal to $a^\lambda + x^\lambda$.

For instance, if $\lambda = 5$, let the circumference be divided into 10 equal parts, and the point P be within the circle, then will $AP \times CP \times EP \times GP \times IP$ be equal to $\overline{OA^5} - \overline{OP^5}$, and $BP \times DP \times FP \times HP \times KP = \overline{OA^5} + \overline{OP^5}$. In like manner if $\lambda = 6$, having divided the circumference into twelve equal parts, $AP \times CP \times EP \times GP \times IP \times LP$ will be equal to $\overline{OA^6} - \overline{OP^6}$, and $BP \times DP \times FP \times HP \times KP \times MP = \overline{OA^6} + \overline{OP^6}$.

The demonstration of this theorem may be seen in Dr. Pemberton's *Epist. de Cotesii inventis*.

By means of this theorem, the acute and elegant author was enabled to make a farther progress in the inverse method of fluxions than had been done before. But in the application of his discovery, there still remained a limitation, which was removed by Mr. De Moivre. See Dr. Smith's *Theoremata Logometrica and Trigonometrica*, added to Cotes's *Harmonia Mensurarum*, p. 114, 115. De Moivre, *Miscel. Analyt.* p. 17.

COTESWOLD, several sheep-cotes, and sheep feeding on hills. It would from the Saxon *cote*, i. e. *casa*, a cottage, and *wold*, a place where there is no wood.

COTESWOLD hills, in *Geography*, hills of England, in Gloucestershire, remarkable for the number of sheep fed there, and the good quality of the wool, a few miles S.E. of the city of Gloucester. See SHEEP and WOOL.

COTHEN, or **COETHEN**, a town of Germany, in the principality of Anhalt Cöthen, of which it is the chief place. There is an old and a new palace. The latter is the residence of the reigning Prince. The Wallstrasse is a very handsome street, planted with trees; it reaches in a straight line, from one end of the town to the other. It contains two churches, two schools, and an orphan-house for Calvinists and Lutherans. N. lat. $51^\circ 44'$ E. long. $11^\circ 52'$

COTHELSTONE, a village on the Quatock-hill, in Somersetshire: the lodge in this parish is a building in a very elevated situation, the place of which was determined in 1795, by a trigonometrical observation from Dumpdon station, distant 64,521 feet, bearing $2^\circ 29' 45''$ S. W. from the parallel to the meridian of Black-Down; and from

Pilsden station distant 104,901 feet, whence is deduced its latitude $51^\circ 0' 23''.9$ N. and its longitude $3^\circ 8' 59''$ or $12' 35''.59$ W. of Greenwich.

COTHIBELE, a town of Africa, in the kingdom of Morocco, and province of Tedla.

COTHON, in *Ancient Geography*, a small round island before the city of Carthage, mentioned by Strabo, who adds, that it was surrounded by the sea. Appian says that it was the name of a port, square on the one side, round on the other, and encompassed by a wall. Cothon was also the name of an artificial port, the term being of original extraction, and having this signification. Accordingly, this seems not to have been a proper and a common name amongst the Carthaginians, who pronounced it "Kathum," or "Kathom." The Carthaginians were so extremely active and indefatigable, that when Scipio had blockaded up the old port, or Cothon, they, in a very short time, built a new haven, the traces of which, scarcely 100 yards square, are still to be seen. See CARTHAGE.

COTHON, an island of Greece, on the southern coast of the Peloponnesus, in the gulf of Laconia.—Also, the port of Carthage; and the port of the town of Adramittium, in Africa.

COTHURNUS, **BUSKIN**, a very high shoe, or patten, raised on soles of cork; worn by the ancient actors in tragedy, to make them appear taller, and more like the heroes they represented; most of them were supposed to be giants. See **BUSKIN**.

COTHY, in *Geography*, a river of South Wales, in the county of Carmarthen, which runs into the Towey; three miles E.N.E. of Carmarthen.

COTIARI, a small island near the east coast of the island of Ceylon; 20 miles E.S.E. of Trincomaly.

COTIARIS, in *Ancient Geography*, a river of India, in the country of the Sines. Ptolemy says, that it joined the Senus at a great distance from their mouths. M. d'Anville supposes that this geographer refers to the different branches of the river of Camboja, which was divided into many parts at the distance of 100 leagues from the sea.

COTICE, or **COTISE**, in *Heraldry, is a term used to express an escutcheon divided bendways into many equal parts, as in the coat of arms which they blazoned thus, "*Cotice d'argent et azure de dix pieces*;" yet if the coat be divided into six equal parts only, they blazon it *bendy of six*, in the same manner as we do.*

COTICULA, in the *Natural History of the Ancients*, the word by which the Romans expressed the *axony* of the Greeks; a stone of very great hardness, brought from Armenia, and used on many occasions; one of which was the working on such of the harder stones as iron instruments would not touch.

Many of the ancient Greeks, who had this stone from the island of Cyprus, called it, from its hardness, by the same name with the diamond, as they sometimes did iron also; which manner of writing has much misled those who have copied too carelessly from them; and even Pliny, who after having in one part of his book given a right account of this stone, and called it *cos*, in another gives a different history of it, mistaking it for a diamond.

This coticula was long in great esteem with the ancient artificers on gems, and served not only to work upon such of the gems as iron could not touch, but was used to bore holes through such as they strung on threads, and hung in rows in their ornaments of the bracelet-kind. And Pliny's account of the other gems being bored with Cyprian diamonds, means no more, than that they were worked with

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this coticula, which was anciently had from the island of Cyprus, and afterwards from Armenia, and was called by some, in a metaphorical sense, *adamas*, from its great hardness.

COTICULA is also a name given by many to the touchstone; not from its being of the nature of the coticula of the Romans, but from its being, for the convenience of carriage and use, frequently found in the shape of a whetstone.

COTICULARIS SCHISTUS. See HONE.

COTIEL, in *Geography*, a town of the island of Borneo; 140 miles N. of Banjar-Massin.

COTIERI, in *Ancient Geography*, a people mentioned by Pliny, as forming a part of the nation of Scythians.

COTIGNAC, in *Geography*, a small town of France, on the river Argenis, in the department of the Var, 6 miles east of Barjoles; famous for its confectionary and preserved fruits, which are reckoned a delicacy all over France, Italy, and Germany. It has 350 inhabitants; and is the chief place of a canton, which contains 6 communes, and 10,147 inhabitants, upon a territorial extent of 210 kilometres.

COTIGNOLA, a town of Italy, in the Ferrarese, surrounded with walls and ditches. This town is 25 miles S.S.E. of Ferrara.

COTILLON, *Fr.* a well known dance for eight persons, who settle the figure previous to starting. The word literally means a petticoat; but perhaps became a technical term in music, from the old French song:

“ Mon cotillon va t'il bien.”

COTINGA, in *Ornithology*, a genus of birds in the system of Buffon, distinguished by their beautiful plumage, all the species of which belong to the new continent. As they delight in warm countries, they seldom occur south of Brazil, or even north of Mexico. Their journeys are confined within a narrow circle; they appear twice a year in the plantations, but are never observed in flocks. They generally haunt the sides of creeks in swampy ground; whence some have called them water-fowls. They live upon insects. The Creoles hunt them, partly on account of the beauty of their plumage, and partly on account of the delicacy of their flesh. Their size is from that of a small pigeon to that of a red-wing; the edges of the upper mandible, and frequently those of the lower, are scalloped near the tip; the first phalanx of the outer toe is joined to that of the mid-toe; and, in most of them, the tail is a little forked or notched, and consists of twelve quills. To this genus Buffon refers the *AMPELIS Cotinga* of Gmelin, his own *Cordon bleu* or blue Kirband, or the purple-breasted *Chatterer* and *Manakin* of Pennant, Edwards, and Latham. It is also called the “thrush of Rio Janeiro;” and by the Creoles, “hen of the woods.” Gmelin characterizes it as of a very bright blue, below purple, and wings and tail black. It is found in Brazil. *Cotinga Cayanensis* is the *AMPELIS Cayana* of Gmelin, the *quaveira* of Buffon, and purple-throated *chatterer* of Latham. Its specific character is bright-blue, with its neck violet-blue. It is found in Cayenne. The *Cotinga Mayanensis* of Buffon is the *AMPELIS Mayanna* of Linnaeus and Gmelin, and silky *chatterer* of Latham. Its specific character is bright-blue and violet throat. The *Cotinga purpurca* of Buffon is the *AMPELIS pompadora* of Linnaeus and Gmelin, the *pacopac* or *pompadora* of Buffon. Its specific character is, that it is purple; the nearest coverts of its wings are sword-shaped, elongated, boat-shaped, and stiff. Of this there are several varieties; found in Guiana. The *Cotinga rubra* of Buffon is the *Pouette* of Buffon, and *AMPELIS Carnifex* of Gmelin, the red *chatterer* of Latham, and

red bird from Surinam of Edwards. Its specific character is, that it is red; the stripe at its eye, and the tips of the quills of the wings and tail, are black. Migrating, but common in the interior parts of Guiana. The *Cotinga alba* of Buffon is the *Guira panga* of Buffon, *AMPELIS Carunculata* of Gmelin, and carunculated *chatterer* of Latham. Its specific character is, that it has a pendulous, expandible, and moveable caruncle at the base of the bill; found in Cayenne and Brazil. The *Cotinga Newia* of Buffon is the *Averano* of Buffon, the *Guira-punga* of Ray and Willughby, and the *AMPELIS Variegata* of Gmelin. Its specific character is, that it is cinereous, and that to its throat are attached two lance-shaped caruncles; found in Brazil. The *Cotinga Mexicana* of Buffon is the *STURNUS Mexicanus* of Gmelin, which see. The *Cotinga cinerea* is the *Lanius Nengata* of Gmelin, which see.

COTINUS, in *Botany*, *coriaria*; Dod. Du Ham. See *Rhus Cotinus*. The *κωτινος* of the Greeks is the oleaster or wild olive.

COTLAND and COTSCHLAND, land held by a cottager, either in socage or villenage. Paroch. Antiq. 532.

COTO. See KOTO.

COTOMANA, in *Ancient Geography*, a town of Asia, placed by Ptolemy in Greater Armenia.

COTONASTER, in *Botany*, Clus. C. Bauh. See *MESPILUS*.

COTONEA, and *COTONEA Malus*, Lob. and C. Bauh. See *PYRUS Cydonia*.

COTONIS *Insula*, in *Ancient Geography*, an island of the Mediterranean sea, and one of the Echiades. It was situated on the coast of Erolia, according to Pliny.

COTOPAXI, in *Geography*, a mountain of S. America, in Peru, situated about 25 miles to the S.E. of Quito, and estimated at about 18,600 feet in height, with a volcano famous for its frequent and violent eruptions. M. Bouguer observed stones of eight or nine feet diameter ejected from this volcano to the distance of more than nine miles.

COTORSE', in *Heraldry*, is the French heraldic term for cottised.

COTPUTLY, in *Geography*, a town of Hindoo-tan, in the country of Meurat; eight miles S.S.W. of Delhi, and 90 N.N.W. of Agra. N. lat. 27° 35'. E. long. 76° 50'.

COTRODES, in *Ancient Geography*, an episcopal town of Asia, in Iauria. Steph. Byz.

COTRONA, in *Geography*, a town of Naples, in the province of Principato Citra; 14 miles W. of Cangianno.

COTRONE, a town of Italy, in the province of Calabria Ultra; 12 miles S.E. of St. Severino. This town succeeded to the Greek city of Croton, though it does not occupy the same extent of ground. The climate is said to be now unhealthy in summer, on account of some local causes; but the salubrity of Croton was among the ancients proverbially salubrious. The river Esaro, which flowed through the centre of the old town, now runs in a shallow stony bed, at a considerable distance N. of the gates. A new harbour has some years ago been formed by great works for this town. But in the construction of it, due attention has not been paid to the safety of vessels riding before the town. The entrance of the town is open to the N. and N.E. winds; points of the compass, from which very boisterous blasts rush down the Adriatic, across the Tarentine gulf, though perhaps less tremendous than the Sirocco and southerly winds, whereas, if the mouth of the haven had been more easterly, the entrance would have been more easy, and the vessels less disturbed while in port.

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This harbour is capable of containing a considerable number of merchant-ships, but none above the tonnage of a polacca. The mouth of the port is marked by two light-houses. Cotrone is fortified with single walls, and a castle, erected by Charles V. The private buildings are poor and fordid; the streets dismal and narrow; and ill-humour, misery, and despondency, says Swinburne, were depicted on every countenance. The town has little commerce; its chief commodities are cheese made of goat's milk, and corn; for the latter there are granaries in the suburbs, and the annual export is about 200,000 tomoli, two of which are equal to three English bushels. See CROTON.

COTRONGIANO, a town of the island of Sardinia; 10 miles E. of Sassari.

COTSATHLA, or COTSETLE, the little hut or mansion belonging to a small farm. Cartul. Malmb. MS.

COTSATHUS, a cottage-holder, who, by servile tenure, was bound to work for the lord. Cowel.

COTSETS, are the meanest sort of men, now denominated cottagers.

COTSIOPIRI, in *Botany*, Rumph. See *GARDENIA florida*.

COTT, in *Sea Language*, a sort of bed-frame, suspended from the beams of a ship, in which the officers sleep between the decks. It is about six feet long, one foot deep, and between two and three feet wide. See HAMMOCK.

COTTA, JOHN, in *Biography*, an elegant Italian scholar, was born near Verona about 1483, and became very celebrated for his attainments in classical and mathematical knowledge. He went through various important scenes, and travelled for some time in order that he might improve his mind; he then kept a school at Lodi, and at length attached himself to Alvino, a Venetian commander. Under him he was taken prisoner by the French in 1509, and lost part of his writings. He died in 1510, in his 28th year, by which time he had acquired a very high reputation by his poems, which have been published at various times, particularly in the "Carmina quinque Poetarum." Moreri.

COTTA, COTES, or COTTES, in *Ancient Geography*, a town of Africa, placed by Piny in Mauritania Tingitana, near the columns of Hercules. He elsewhere says, that it was a place not far from the river Lixus. *Cotta* was also a mountain, nor far from the Lixus, in which was a cavern consecrated to Hercules. *Cotta, Cotes, or Cottés*, was also a port or bay, mentioned by Scylax, which was probably in the neighbourhood of Cape Cotta; but if that be the case, it is erroneously placed between Cape Mercury and the straits of Hercules. See COTTES.

COTTA, in *Geography*, a town of Germany, in the circle of Upper Saxony, and Margravate of Meissen; 10 miles S. of Pirna.

COTTÆOBRIGA, in *Geography*, a town of Spain, in Lusitania; placed by Ptolemy in the country of the Vettones.

COTTAGE, in *Rural Economy*, a name mostly applied to a small house usually erected for the use and accommodation of either the farm labourer, or those engaged in some other business or occupation; but chiefly such as are connected with that of agriculture. They were formerly in most cases constructed of rude materials of such kinds as could be the most readily procured or provided, frequently of earthy substances, blended with others of a very perishable nature, such as straw, having the denomination of *mud cottages* in some districts, and *cab dab* in others; but which have lately given way, in some measure, to those of a more durable and lasting kind, which, in the end, are probably by much the cheapest even in this sort of buildings. The

practice of connecting cottages with farm lands, was heretofore much more common than it is at present, but however greatly it may have declined within these late years, there can be no doubt, but that it was a system which was highly advantageous to the interest and convenience of the farmer, as well as the land proprietor. It has indeed been observed by the author of "Practical Agriculture," with regard to the beneficial consequences resulting to the former from the cottage plan, that, "though he may have a certain number of labouring people constantly about him, they will not be able, on every occasion, and in every place, to perform all the business that is necessary on his farm." He must therefore either be under the necessity of keeping more servants than are absolutely requisite, at great expence, or he must have recourse to the aid of the cottage labourer; which, he thinks, proves the utility and importance of the cottage system, as connected with the labour of farms. But, he conceives, that this is far from being the only point of view in which it is of consequence. "It is mostly, he adds, from amongst this class of men, that the best and most expert labourers in the business of husbandry are procured; being, in general, inured from their infancy to such labours, and accustomed to perform the different operations of farming, they are enabled to manage the practical part of agriculture with much ease and readiness, which is far from being the case with the common labourer, who, for the most part, has been brought up to some other occupation or employment. Besides, on such farms as are at the greatest distance from towns and villages, these accommodations for labourers seem indispensably necessary, as without them much time must, of course, be lost in going backwards and forwards to their different meals, and the places in which they lodge; and from the unavoidable fatigue that attends this mode, they are little disposed to procure work at a distance, if they can possibly get it at the places where they reside, which, in many situations, often reduces the farmer to much inconvenience, if not actual loss." He consequently supposes that, where the system of cottages "can be introduced with convenience, and a mutual interest be established between the farmer and the labourer, it will be to the advantage of the former to have as many cottages on his farm as possible; and under some circumstances, as in case of a long lease, it may even be advantageous for him to build them, or, at least, assist the proprietor in doing it, by the conveyance of materials, and other such means as are in his power. And in order that an object of such importance to husbandry may be accomplished more readily, and with greater facility, all those legal and parochial obstructions should be removed, which have any tendency to impede the erection of such sort of buildings. There are likewise various difficulties of a local nature, which not unfrequently throw obstructions in the way of providing this kind of accommodations, whether for the farmer or the manufacturing labourer.

In the seventh volume of the "Letters and Papers of the Bath and West of England Agricultural Society," it has been usefully remarked on this subject that, as "manual labour is and always must be necessary for the cultivation of land, it follows, of course, that houses for the habitation of those who are to perform that labour are indispensable;" and that "if the inhabitants of these houses are in health and able to work, they will be able to support themselves by the hire of their labour. If they are not, they become a burden to the parishes to which they belong, and the laws will oblige the landholders to maintain them. To preserve the health and strength of these poor but necessary fellow-creatures, is therefore," he adds, "not only the duty but the interest of the landholders. Men of feeling will endeavour

to do this from principle. Men without feeling, if such men there are, will find it their interest to do it."

And, "the first step towards this necessary purpose is, that of providing proper habitations for them. Humanity shudders at the idea of an industrious labourer, with a wife, and perhaps five or six children, being obliged to live, or rather to exist, in a wretched, damp, gloomy room, of ten or twelve feet square, and that room without a floor; but common decency must revolt at considering, that over this wretched apartment there is only one chamber, to hold all the miserable beds of this miserable family. And yet instances of this kind, to our shame be it spoken, occur in every country village. How can we expect our labourers or their families to be healthy, or that their daughters, from whom we are to take our future female domestics, should be cleanly, modest, or even decent, in such wretched habitations? In order to remedy this serious grievance, more convenient and more numerous cottages should, he contends, be built for the habitation of the labouring poor."

And it has been justly remarked by Mr. Rudge, the intelligent author of the "General View of the Agriculture of the County of Gloucester," that "cottages are equally necessary with mansions and farm houses, though it appears by the face of the country, that this evident truth is not always recollected. In general, through the kingdom it is to be feared," he thinks, "that the popular complaint against the dilapidation of cottages is but too well founded. In the Vale, as well as other parts of this county, there are numerous instances of this mistaken policy; and under all the circumstances of the increased cost of materials, and builder's wages, it is scarcely to be supposed that the evil so far gone will find a speedy remedy. Landlords generally deem building cottages an unprofitable way of expending money; yet a land owner should recollect, that he cannot expect tenants for his lands, if proper places are not provided for the residence of the labourers. A tenant, indeed, taking a farm, either not foreseeing the speedy operation of the evil, or looking up to the landlord for redress when it shall happen, seldom if ever troubles himself about the number of cottages annexed to it. Overseers are not often aware of the power the law gives them of erecting cottages on the waste; and hence it follows that more families are crowded together than is either consistent with comfort, health, or decency; or a remedy is applied worse possibly than the disease, which is, to build a workhouse, into which every person wanting relief is crammed without distinction of age, sex, or cause of distress."

"A cottage which merely protects the inhabitants from the inclemency of the weather is an incomplete provision; sound policy, he thinks, requires some concomitant advantages to attach him to his dwelling."

Mr. Holland, in his "View of the Agriculture of the County of Chester," makes an observation which is confirmed by most of the other Surveys which have been drawn up for the consideration of the Board of Agriculture, that "on long experience it has been invariably found that the attachment of a small portion of land to the cottage of the labourer has been the direct means of rendering his situation in life more comfortable and easy, and of inducing those habits of honest independence, of temperance, and of industry, which are most efficacious in promoting the happiness of individuals, and consequently the general interests of society." Mr. Rudge does not, however, think that "a cow is one of the necessary appendages to a cottage, or generally productive of good. In particular cases the experiment has succeeded well, as reported by Lord Winchelsea on his estates, and it will perhaps succeed in others, where the

influence of a great land proprietor extends over the whole parish or district; but property in few instances is thus consolidated. Besides, the management of a cow is attended with considerable trouble, requires more utensils than the earnings of a day-labourer can well supply, and more conveniences of building than are usually attached to a cottage. Capital is," says he, "the sinew of husbandry, and unless it be proportioned to the undertaking, the efforts will be weak, and the success uncertain." See *COTTAGE Farm*.

And he thinks there is reason to doubt whether the labourer or his wife will be able to spare the time from their respective employments, and should it so happen, the evil will overbalance the good. It is pleasing to see a good garden and a pig attached to the cottage; but neither of these interfere with the daily services of the labourer, or withdraw him from the necessary attention to the business of the farmer.

He concludes that the greatest of evils to agriculture would be to place the labourer in a state of independence, and thus destroy the indispensable gradations of society. The great body of mankind, being obliged to live with and by each other, must necessarily consist of proprietors and workmen; and if it be allowed that the dependence of a regular supply of crops rests, among other things, on the regular services of the latter, it is surely an experiment not altogether without danger to place them in such a situation as will cause them to remit a portion of their labour, at a time when it is most wanted.

"Would you," says he, "then, it may be asked by the philanthropist, confine the labourer to his situation, and prevent his rise in the scale of society? No; but I would wish it to be left to his own industry and exertion: he should have more land than is usually held with cottages. The great object is to enable him to subsist without parochial relief, and this is essentially to increase his comforts. What more is done, should be the result of a conduct peculiarly frugal and industrious. I would," says he, "always wish to infer from neatness in the cottage, the pig in the sty, and store of vegetables in the garden, that the occupier has neither been inattentive to his own, or the general interests of agriculture: and such a man will feel an attachment to his possessions, from the consciousness of having brought them to their present state of improvement by his own care. His desire to protect and improve his property will also be increased by the recollection of the labour he has bestowed upon it; and when surrounded by his family he can with truth admonish them to be attentive to their duties, in order to better their condition, not only by pointing out the evils of idleness and vice, but by shewing, in his own instance, the good effects of industry and prudence, cleanliness and virtue."

"Influenced by these considerations, the writer wishes that every industrious labourer possessed a legal right, under certain restrictions, to build a cottage for himself with his own savings, and the voluntary assistance of his neighbours, and to inclose a garden of a limited extent from the waste; or that in any way he might have a permanent security in the premises he occupies, till by idleness and vice he should become unworthy of encouragement."

It is the practice with lord Rolle, on the borders of the wastes of Woodbury and other commons connected with it, as stated by the writer of the "Agricultural Survey of Devonshire," to encourage "the peasantry to build and make small improvements. The inducing of the labourer thus to leave the village, and settle upon the borders of the commons, is considered by far the most likely means of promoting the comfort, and improving the morals of these people. The quantity of land first permitted to be inclosed

is about an acre. This improvement conducted to his lordship's satisfaction, a farther inclosure is suffered to be made, to the extent of three, four, or five acres, and which, in some cases, have led to the cottager's obtaining a long lease of his improvements at a very moderate rent, and with the farther privilege of inclosing more of the waste, when his strength and ability will enable him to render it equal justice with that he may have already improved. In thus withdrawing the cottager from his former haunts in the village, the time that would otherwise be spent at the alehouse, or in frivolous conversation with his neighbours, is now employed to the immediate benefit of himself and family, and ultimately to the increase of the national stock."

And in the same district lord Clifford is said to attach to his cottages a small piece of garden ground, with the privilege of cultivating as many potatoes as their industry may prompt, or leisure admit of, in the young plantations; a small orchard sufficient to produce from one to two hog-heads of cyder, with a sufficiency of good boarding or winter apples, is also granted to each peasant's family, in lieu of the grazing of a cow, which they were formerly indulged with. The cow being subject to accident, places this munificence on a more permanent footing.

It appears at present an opinion pretty generally adopted, that, wherever it can be done, some limited portion of ground should constantly be attached to a cottage; but the mode of attaching it, and the quantity which is requisite in different cases, are matters of considerable difficulty, and which must, probably, depend on various local circumstances, such as the abundance or scarcity of land, the manner in which it is cultivated, and the dispositions of the occupiers. In every situation, perhaps, a sufficient quantity for the growing of proper vegetables for the cottager and his family may be spared, as for this purpose not more than twenty or thirty perches of ground will be required.

Mr. Rudge contends that "it ought not to be extended so far as to occupy too great a portion of the labourer's time; nor, however beautiful it may be in theory to raise the lower orders to a situation of comparative independence, ought the line to be faintly marked between the proprietor and labourer, as without this distinction neither agriculture nor commerce can flourish."

This has been observed to be a system which tends not only to benefit the cottagers, but which, at the same time, must greatly contribute to the interest of the owners of land, and the community in general. Such a plan cannot, indeed, from various local causes, be generally introduced; but it may be rendered much more common and extensive than it is at present, since the narrow, confined, and illiberal notions which have so long retarded its execution have now been fully shewn to be erroneous and ill-founded. The advantages of gardens are great, in respect to the labourers themselves, as the attention they require prevents them from visiting the ale-houses; and it has been well remarked, that there is a striking difference between the cottagers who have a garden adjoining their habitation, and those who have no garden; the former being generally sober, industrious, and healthy, while the latter are too often drunken, lazy, vicious, and frequently diseased. See *COTTAGE Farm*, and *COTTAGE Garden*.

Mr. London, in his valuable "Treatise on forming, improving, and managing Country Residences," after noticing the great advantages of improving the comforts of the labourer, by rendering his dwelling more commodious, and suggesting that from the simplicity of his establishment, but few and small apartments are required, the whole being

constructed with the greatest attention to use and economy, remarks, that though from the great diversity of materials supplied for this purpose in different countries, as well as the difference of climate, there may be much variety in the buildings of this nature in them, the cottages of Great Britain may be considered under two distinct classes, namely, the ENGLISH and the SCOTCH; from which he conceives all the other varieties have proceeded.

COTTAGE, English. It is supposed from the mild state of the climate, the evenness, and freedom from rocky inequalities in this part of the kingdom, that "the walls of the more ancient erections of this sort were constituted of clay, turf, and other similar materials, strengthened and supported by posts and cross pieces of wood, which was so predominant at the time in the country. The roof was considerably elevated, as the higher it was, the pressure upon the side walls was more perpendicular, and consequently less liable to derange the materials than if it had been more lateral, which is the necessary consequence of a flatter roof. This roof was also made to project considerably over the wall, that the rain might be entirely thrown off; for it is evident that it would have otherwise soon destroyed the adhesive qualities of such crude materials. This projection was likewise useful in keeping off the rain from the windows and doors; so that in general it served a double purpose. Often, however, windows were made in the lower part of the gable; and though the projection extended over that part also, yet from the height of the eaves of the roof, the rain in falling, particularly in times of wind, might be thrown inwards upon the window. To prevent this, a projection was made over it for the express purpose of keeping off the same; and as it was known to be also advantageous in preserving the wall, it was sometimes carried across the whole end or gable, as we see still practised in several places." And he adds, "that the chimnies in this style of cottages were generally carried up singly at one or both ends of the building, commonly in the outside of the wall, and generally of a roundish shape, and terminated with a projecting coping to keep off the rain. The materials of the roof were principally wood, covered with straw, reeds, or slate stones. Sometimes garrets were formed under it, and consequently windows were placed either in the end, in the flank, or slope of the roof, or both. The form of the windows was every where much broader than high, both from the lowness of the side wall, and more suitable for giving light. This required a long cover at top; but these were frequently supported in the middle by upright pieces, which served to divide them into compartments." It is further stated, that "to this general form, which includes every thing relating to the personal accommodation of the cottager, he frequently, when in possession of a cow or a horse, added a small shed and other hovels to one end, or to the side; the methods of doing which are too obvious and simple to require explanation.

"From circumstances which it is unnecessary to recount, this kind of cottage would," he thinks, "in time be made two stories in height. In this case, if the walls were still made of clay, the projections would be continued, and also placed over the lower windows; but as brick or stone would be often used, when this form was adopted, there would then be less reason for a projecting roof. But, from the thinness of the walls, the windows would necessarily be placed nearly even with their surface, and consequently much exposed to the weather; still," he says, "projections over them became necessary, as well as over the doors. These projections, as in other cases, would sometimes be made of

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wood, and sometimes of slate or grey schistus; sometimes carried across the whole length of the side walls, and sometimes no farther than over the windows."

The able writer observes further, that "cottages of both these kinds, formed of clay and wood, may be seen in many parts of Worcester-shire, Gloucester-shire, and Herefordshire. In other counties the same form exists, but the materials are either entirely bricks, or bricks with the wood in place of clay, turf, or even stone above, as at Ambleside in West-merland, and several parts of Lancashire."

COTTAGE Scotch. It is suggested by the same author, that "the peculiar forms of these originated from the abundance of stones, the comparative scarcity of wood, and the severity of the climate. In them the walls were built thick, in order that they might contribute to warmth, and bear the weight of a slated roof. The flat roof was preferred, both because less of that scarce article wood was requisite, and also because this form was less liable to be injured by the winds, which always prevail in naked, mountainous countries. The walls in this style not being so liable to decay as in the other, the projection of the roof was comparatively small. This did not give occasion, however, to projections over the windows, because the walls being thick, the glass frame was less exposed to the weather by receding from the outer surface of the wall. The form of these windows was narrow, in order that a stone of no uncommon length might easily cover them at top; and this shape likewise better secured them from the weather; still, however, as these cottages required as much light as the others, the windows were made proportionally deep; and this gave rise to a mode of framing and glazing different from the English; and hence also another mode of opening the glass frames for admitting air. In these long narrow windows it is done by having the glass cases divided horizontally. In the broad low English windows, it is done by dividing them perpendicularly. In the former case, the sashes are placed in grooves, the upper one fixed, and the lower one loose; in the latter case, one or both of the frames have hinges, and open either outwards or inwards." It is added, "that in the Scots cottage windows the glass is always in large square pieces, fixed in wood; in the English, always in small square or rhomboidal lozenges, glazed in lead, and fixed in an iron frame."

It is stated, that "the chimnies in this cottage were sometimes, and most generally, carried up in the two end walls or gables; but frequently in the central wall which separated the two apartments. But "there is a sort of cottage common in several parts of the north, in which the chimney is a hollow cone, or pyramid, formed of wood and clay, and suspended from the gable; the fire is made in an iron grate with open ribs on all sides, and, placed under the middle of this projection, diffuses its heat on every side, while the smoke ascends the wide cone or chimney. This plan has the advantage of allowing a numerous family to sit around it, and originated from the practice of small farmers who formerly used to live in their kitchen with their servants and the whole family." It is a practice still in use in several parts of England: but it is chiefly given up in Scotland. "In this case the roof was sloped on all sides in the pavilion manner. The roof here, as in the other kind, was covered with the most ready materials, generally thatch and turf; in some places heath was used, as in many parts of the Highlands; in others blue slate, as in Peebleshire; grey stone slate, as in Kircudbright; or red flag-stones, as in most parts of Dumfriesshire. In every case, the roof being slated, light garrets were inadmissible; and, of course,

windows were made in the gable ends, or in the sides of the roof."

It is suggested that from this sort of cottage being peculiar to poor countries where rocks and stones most generally abound, "the cottagers were seldom blessed with a cow, or even pigs, and hence had no occasion to add appendages as in the other case. Fuel and most other things were lodged under the principal roof. Happily in all the improving counties of the north, the practice of giving cows to all the farm servants is becoming general; and the pleasing appendage which they occasion, begins to appear in many of the counties south of Edinburgh. In most of the northern and western counties, however, there still exists a peculiar formality, or sense of imagined dignity which manifests itself upon every occasion, both in the physical and moral actions of the inhabitants. They are strict and formal in their religion; and so rigid in regard to symmetry, which, in a country so very irregular, it is natural to imagine will be the most striking and generally perceived beauty, that rather than make a cottage irregular by an exterior appendage (necessary for a cow) they extend it in length, adding a gable and chimney top: thus making the external appearance of the cow-house and the lodging apartments exactly alike. Hence a house of this kind presents a chimney at each end, and two doors placed together in the middle. One of these doors is the entrance of the cottager; the other that of his cow." The author "would not have thought this circumstance worthy of notice were it not that some respectable improvers near Edinburgh, are building a number of stiff unconnected cottages of this kind for their labourers, under the name of ornamental cottages. It must be evident to every one that whatever their form may be, they can never be clear, fresh, and wholesome, as if the cow-house was made an appendage, with its door either in the end or at some distance from the door to the living apartments of the peasants. The Scots cottage, when increased in height, so as to contain two stories, has still more formality than the low kind from being of greater magnitude."

It is remarked, that "these two styles are in general formed pretty distinct; but that, as in the borders of Wales, and the north of England, or where the people from one country have migrated to another, they are found mixed or blended in various degrees, as is the case in Northumberland, Lancashire, and some parts of Sterlingshire, as at Carron."

From the description of these simple and useful forms of cottages, the same author proceeds to the addition of ornaments. It is rightly conceived, he says, that utility constitutes the chief beauty of the cottage, and that it is frequently from simply attending to this, that the manner and dress of the humblest class of society become so agreeable and pleasing. But that, in regard to dress, we, in general, find that "no sooner has the pretty milk maid been enabled to cover her bosom with a shawl, or her hair with a straw bonnet, than she wishes to adorn her neck with beads. So it is with the labourer and his cottage; it is no sooner erected, and he comfortably lodged, than he thinks of something farther, and begins to add ornaments. These, it is true, are more generally confined to the internal parts of it; but are often applied also to the external; and especially when cottages are near the highway, or when they are collected together in villages, through an ambition to excel in neatness and decorum.

"It is conceived, that in the English cottage of the original kind, with the projecting roof, the first external ornament

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ment would be to take chalk, and whitewash the clay walls, which would have a wonderful effect in giving them a gay appearance. The next thing in this style would be the decorations of their little garden, and the planting of roses, or some of the smaller fruits against the pales, which enclose it. And now, proud of this little spot, he would erect a seat close under the roof, and at the side of the door, on which he may sit with his children after the close of his labour, and enjoy the general effect of the whole."

When this sort of "cottage was made two stories high, the chief difference in the style of ornament would be, that in place of whitewashing the walls, he would plant fruit-trees or ornamental creepers of some sort against them, which he could not do in the case where projecting roofs were adopted."

But "the inhabitant of the other cottage, the Scotch, naturally of a less gay disposition, is not profuse in whitewashing the external part of his house; he bestows a little of it however upon the edges of his windows, to indicate that all is comfortable within. He frequently places a seat near the door as in the other style; though the difference of the climate is adverse to this luxury, and indeed the nature of the foreground, which would come immediately under his eye, is not of an inviting kind to any of the senses. Scotch cottages in a few situations, however, either from their vicinity to another style, or from accidental circumstances in the employment of the inhabitant, are decorated with excellent effect; by training honeysuckles or ivy upon the walls, and also by adding another ornament not very general in the other style. This is a row of house-leek placed along the ridge of the roof. In a few years it becomes highly ornamental, and the stems of its flowers probably, he thinks, gave rise to a mode of decorating the same part in professed ornamental cottages."

It is stated, that "cottages decorated in this way may be seen in several villages near Edinburgh; but in their style there remains ample room for the interference of gentlemen, who, with little or no trouble or expence, might oblige their cottagers to plant trees in their gardens, and train creeping shrubs upon their walls; which, with the removal of an appendage in front, *peculiar to that country*, and which shall be left unnamed, would contribute much to the beauty of villages, and ultimately tend to increase the health and comforts of the peasantry."

It is conceived, that these are the ornaments which "would naturally be added by the inhabitant himself, and what would long constitute the sole decorations of cottages." But that "there is another class which, in a certain stage of the progress of society, the builder would introduce: thus, as the houses of rich individuals, or the churches and cathedrals of rich bodies of men, became common, artisans to construct them would become more numerous, and as they could not always be employed in these great buildings, they would frequently assist those whose occupation was chiefly that of rearing buildings for the lower classes of mankind. This, from a principle of vanity inherent in man, would lead them, even in these low buildings to imitate, in some degree, what they had been accustomed to in their greater works. And as the vulgar, in imitating the manners or dress of the rich, always attached themselves to the ornamental parts; so those artists, disregarding the proportions of rooms, or the principles of strength in walls or roof, would copy such mouldings and cornices as could be applied over their doors and windows. Hence, in place of mere projections of wood or slates placed over these parts to keep off the rain, Gothic labels of hewn stones would be substituted. Instead of plain round or square chimney tops,

they would erect those clustered angular stalks which have to this day such an excellent effect in many places."

It is added, that "these imitations were carried so far, that in many places the wood, which supported the roof, was carved in all the parts exposed to view; an excess of decoration that would please all, in the tasteless age in which it was executed, which is now passing from its age, but which we need not fear seeing soon renewed, as men of abilities equal to such work cannot be employed by the inhabitants of these buildings. It is thus, that even in matters of taste every evil works its own remedy. In Scotland the imitation seldom went such a length, except in the towns or villages adjoining cathedrals or monasteries, and even in those places it seems, by the fatal influence of general poverty, soon to have given way to the common mode. Occasionally, however, after the introduction of ornament, the gables were finished with hewn stone in successive pieces like steps. A border or frame of stone became frequent round the windows, and slates were more generally introduced on the roofs.

Further, "when Grecian architecture became fashionable, a few of its ornaments were introduced into cottages, particularly in towns and cities where stone was used, as in the suburbs of Edinburgh, Glasgow, &c. But ere this time the great passion for fine buildings, that gave rise to our Gothic cathedrals, was allayed; artists expert at carving on wood or stone became comparatively rare; and the fashionable style of decorating cottages seems, the writer thinks, to have been finally settled at nearly the same as that of the present day."

It has been remarked by Mr. Beafon, in a paper in the first volume of Communications to the Board of Agriculture, that there are different sorts of cottages, which require different constructions: cottages of one, two, and three rooms; some add, cottages of four rooms: but these, he thinks, are seldom built, and are more in the style of houses of a superior kind. There are also cottages for the labourer, and for the mechanic of different trades, as carpenters, smiths, weavers, &c.; each of whom would require a dwelling of a different construction. These different kinds of cottages may, he says, be divided into two classes: the plain and the ornamental: but it is the former only which he means to treat of in this place; the latter being built chiefly as pleasing objects, in different points of view, from the parks or pleasure-grounds of noblemen and gentlemen of fortune. On these a considerable expence is sometimes bestowed; and when executed and disposed with taste and judgment, they afford the most pleasing variety. Of this kind, the completest he has seen are at lord Penrhyn's, in Cheshire, whose cottages are disposed with great taste, and adorned with surrounding clumps of planting; each having a pretty little plot of garden ground and shrubbery in front, and some with honeysuckle and jessamine beautifully entwined round the porch and windows. The insides of these are equally delightful with the outsides, being kept so excessively neat and clean, that it is a pleasure to view them. Different plans of this sort may be seen in the *Plate of cottages of the ornamental kind*.

At the earl of Winchelsea's, in Rutlandshire, are also, he says, some very neat cottages, kept in excellent order; but his lordship has been at a considerable expence in erecting them.

But as the plain and simple cottage for the labourer is the chief object at present under consideration, he endeavours to point out the most convenient, commodious, and best construction for that sort of cottage, and the cheapest manner of executing it. It is found, he asserts, that an apart-
ment

ment : 2 feet square is sufficiently large for a labourer and his family to eat in, and to hold, besides, all the furniture and utensils necessary therein. One sleeping apartment over that, partitioned in such a manner as to be most convenient to the family, and least offensive to decency, at particular times, will constitute, he thinks, all the lodging required in a simple cottage. Square single cottages of this sort may be easily conceived, without having recourse to any representation or plan ; but when they are formed so as to have about four feet more in length than they have breadth, they may be divided to greater advantage in respect to convenience, and be rendered more comfortable, while the additional expence is only trifling.

The Rev. Mr. Luxmore of Bridestow, in Devonshire, in building cottages in rows, found the following plan perfectly convenient, and at the same time economical : the room below 16 feet square, with one door and window in the front ; the fire-place, with an oven opening into it by means of a flue ; a door opening back into a shed or lean-to, for covering fuel, the tools of the labourer, and sheltering a pig, &c. ; and another door from the shed opens into a small back yard, fenced off from the small garden attached to the cottage. A pantry fitted up with shelves is made under the stairs in the front room, which lead up to the bed-room ; and opposite to the fire-place, over which there is a mantle-piece, a kind of dresser is fastened to the wall, with shelves, which constitute the fixture of the room below. The sleeping-room above is the same size. The walls of the first eight feet of these cottages are constructed with stone, the parts above with cob, being covered with a slate roof, and cost from 38*l.* to 40*l.* when finished.

There ought, Mr. Beatson says, always to be at least two cottages built together, from there being, besides other advantages, considerably less expence in this way in proportion, than building them singly. In this case he thinks the space of four feet, noticed above, ought to be taken from the extreme ends, by which the vents would be got in the middle wall, which separates the two cottages. In most of the modern cottages he has visited, (although many of them are perfect in every other respect,) the general complaint seemed to be, he says, that the upper chambers were so excessively hot in summer, and so very cold in winter, that they were scarcely habitable. This is owing, he conceives, to the thinness of a slate or tile roof, and to those chambers being so far within the roof. A proper thatched roof is therefore, he thinks, the best preventative of this evil, where there are upper chambers. If the roof be of tile or slate, which is by far the neatest and most durable, the ceiling should be lathed and plastered, and air-holes with shutters so contrived, that they may easily be opened or shut at pleasure, to give air to the whole roof in hot weather, which will tend greatly to keep the upper chambers cool in summer. Even a white sheet thrown over that side of the roof most exposed to the sun, or the roof itself whitened, will also have the same effect. It is suggested that, in winter, if the angle in the roof be filled with straw, it will probably prevent the cold from penetrating so easily as would otherwise be the case.

The same writer further states, that the saving of fuel is certainly a material object to a cottager ; and as it would be attended with a considerable additional expence to him to keep a fire in the sleeping-apartment above, as well as below, if a method can be devised to give the upper apartment some benefit from the fire below, it would surely, he supposes, be of great advantage in cold weather. This might, no doubt, he thinks, be done by a flue ; but some benefit may be derived from the vent being in the middle of the building, particularly if this vent is made as thin as possible

where it passes through the upper chamber. If that part of it were made of plate iron, or such as is used in stoves on board of ships, it would add, he supposes, considerably to the warmth of the room. There is still another way that occurs to him, that would have a good effect. In all apartments kept warm by a fire, it will be found that the air at the ceiling is considerably warmer than the air below. If, therefore, in a cottage, that warm air is permitted to ascend to the apartment above, it is natural to suppose it will render this apartment considerably warmer. This may be accomplished, either by means of sliding hatches, or by gratings, in the least frequented part of the floor, made so as to open or shut easily when required. These methods of warming and cooling the upper chambers in cottages have probably, he says, never been tried, and are perhaps new : they may therefore be improved upon. At all events, they are at least worthy of being mentioned, if they can in any degree contribute to the comfort of the cottager.

With respect to the economy of fuel, in so far as the construction of the fire-place is concerned, much perhaps still remains to be effected, notwithstanding what has been long since done by Franklin, and lately by count Rumford. From numerous experiments, and much attention to the subject, Mr. London, in his "Treatise on Country Residences," has suggested a plan for this purpose, by which he conceives much more heat will be thrown out from a given quantity of fuel, than by any other which has been hitherto proposed ; and which has the additional advantage of great simplicity. It is represented in *Plate IX. fig. 1.* in which *a* shews the ground plan of the gable, or end-wall, in which the fire-place is to be formed ; *b* is the fire-place, or chamber for the fuel, which is constructed of stone or brick on three sides, but open in the front part ; *c* is the ash-pit, and *d* the floor of the cottage. *Fig. 2.* is a section of the same gable and chimney ; *e*, the grate which contains the fuel, being placed on a level with the surface of the floor, which is shewn at *f* ; *g* is the solid wall or gable, projecting wholly over the fire ; *h*, the vent or chimney, by which the smoke passes away.

The object of this contrivance is accomplished "1st, by the lowness of the fire-place ; 2dly, by the projection over it, which makes the smoke ascend very slowly, and thus gives it time to cool, or give out its heat into the room ; 3dly, by having the vent at *b* of proper dimensions ; that is, such as will neither permit more nor less than the requisite quantity of smoke and air to escape." The ingenious writer has in general found that in similar cases, its superficial contents should be equal to that of the upper surface of the fuel chamber.

There is likewise another circumstance, especially in small cottages, where every little space is of much importance, which is that of constructing the stair-case in such a manner, as that it may take up the least possible room within the building. Mr. Beatson has suggested the following contrivance as practised in Cheshire, with this intention ; by which the stair only takes up half the space, in ascending, that is required in the common way. But it will be better understood by the representation as seen at *fig. 3* in *Plate IX*, which is a front view of the steps ; the width from *a* to *d* is two feet five inches ; *a* is the first step, seven and an half inches high, upon which the left foot is put ; *b* is the step for the right foot, seven and an half inches higher, but in the same line with *a* ; the left foot being set on *a* and the right on *b* alternately to the top of the stair. It is of course evident that, as the steps for the right and the left foot are in the same line, though neither of them rises more each time than seven and an half inches, every time one or the other

foot is moved, it must rise 15 inches higher than it was before, as is shewn at *fig. 4.* in which the dotted lines represent the left foot steps, and the whole lines the steps for the right foot. In a stair of this sort suppose that each head or breadth for the foot is nine inches, and that each rise of one foot above the other is seven and an half inches, as shewn in the figures, it will follow, that, as each foot rises the height of two steps or 15 inches every time it is moved, it must be obvious that six steps in this way will rise as high as twelve in the common method, and will stand in need of only one half the size of a hatchway or opening in the upper floor, that would be necessary for the same number of steps in the usual mode; a circumstance of much consequence where there is little room, and which has the advantage of affording more space for the chambers above.

It is further remarked in the same valuable paper, in order to avoid the inconvenience experienced in small cottages in accommodating a large family of children of different sexes with decency, that much in this view may be effected by a different mode of disposing the beds from that usually adopted; namely that of having one bed placed over the other; and where it is thought proper to keep the boys and girls separate, it may be completely accomplished by having the entrance to the beds of the former on one side and that of the latter on the other side, by which the advantage of separate apartments will be nearly obtained as is shewn at *fig. 5.* in *Plate IX.*

The same writer likewise suggests that every cottage should have two apartments, an upper and lower, though this is thought unnecessary by some, but he advises it principally on the grounds of upper apartments being more healthy for sleeping in than those on the ground, and from much of the most expensive part of such buildings, the roofing, being saved, as well as some of the walling.

In the building of this sort of cottages, the most economical plan the same writer supposes will be that of being directed by the nature of the materials on the spot; where stone in plenty is at hand, it will in general be the most cheap and lasting. Brick is durable but mostly too expensive for this purpose. Earthy materials may be employed with advantage in this intention where it is properly prepared by the use of the rammer; a mode which has been lately practised with much success in different instances in this country, and which has been long employed in France. See *PISE' Buildings.*

Another sort of earthy material constituted of clay, or any sort of tenacious loam, well trodden and wrought together with good wheat straw, is frequently made use of in these buildings, in different districts, especially for the upper parts of the external walls, but it is neither a good nor durable substance, where other matters can be procured.

For the purpose of roofing, the cheapest material is probably that of thatch, especially where feed can be had recourse to; but it is far from being a durable material, though it has the advantage of preserving a more equable temperature in the internal apartments, at different seasons, than most other substances that are usually employed. Heath or what in the northern parts of the kingdom is denominated heather, is not infrequently made use of in the same way, and where it abounds may be employed as a cheap material. It is said to be rather durable in this application. The most safe and lasting sort of articles for this purpose are however, those of the slate and tile kind, though a little more expensive at first. Strong brown paper, well pitched, has been proposed as a light, durable, and very cheap material for this use, by Mr. Beaton, who notices an instance of its being employed with success in the northern part of the island on a building

of large dimensions. Pitch is however a substance which is soon decomposed by the influence of the atmosphere, and of course this would seem to be a material which cannot be much depended upon for the purpose of a covering for buildings.

The flooring, in buildings of this sort, is another material article to be considered. Boards have unquestionably many advantages over most other sorts of materials for this purpose, but the expence is considerable. Where they are employed, deal is probably the best and most reasonable, but where other sorts are at hand, they may be made use of with great propriety, and at perhaps as cheap, if not cheaper rate. But it is supposed that in many situations a considerable saving in the expence of floors may be made by having recourse to plaster for the purpose. It is supposed that this sort of floor would be particularly proper for cottages as being more retentive of heat, than those formed of deal, by which means the upper chamber might be preserved in a more warm state during the winter season. It is however more than probable that the absorption of moisture would more than counterbalance this supposed advantage, as there can be no doubt that such substances have such tendency to draw humidity from the surrounding atmosphere. See *FLOOR, and ROOF.*

The author of the "Survey of the County of Salop," is in general a friend to single cottages, because two families under one roof may have more causes of contention arise between them; on the other hand, in illness, poor persons have frequently the merit of forgetting their differences, and then the assistance they are inclined to give each other is made more easy by nearness of situation. It is possible, however, where two or even three houses are joined together, to contrive the gardens in such a manner that there shall be little interference, and sometimes three neighbouring families may do better together than two.

It is suggested as a convenient plan for this sort of building to have the door to open opposite to the jamb of the chimney, so as to shelter the kitchen fire-place; with the chimney in the middle, so as to keep the two chambers warm; neither of which should be a thoroughfare to the other, as by this means the education of the children may be more decent. The gable ends should be so formed as each to admit a sufficient window for the purposes of light and air, which, where the chimney is at the end, cannot be the case, and when not in the end a dormant becomes necessary in the roof, or the walls must be raised unnecessarily high for the purpose of getting proper room for the window. In many cases the room next the kitchen may be conveniently occupied as a work room, and where fire becomes necessary for the business or warmth, that in the kitchen may serve both apartments, by having the contrivance of an iron door in the back of the chimney. This is suggested as an idea of the late Dr. Franklin. A fire place in the larger bed chamber would be convenient in many cases, as of sickness, &c. The size of the two bed rooms should not be too large, as in that case inconvenience may be produced from too many of the family being crowded into one of them, health and decency being forgotten, in order to preserve the other for the accommodation of a lodger, or occasional mendicant traveller. It is added that in some cases no upper rooms are necessary, the ground floor being sufficient; and that where a ground floor is made perfectly dry there is a convenience in having the bed-room to open out of the kitchen, because the kitchen fire will be sufficient for the purpose of illness: and that the bed-room, if dry, will be warmer, as being less exposed to the wind, and less liable to be heated from the roof in summer or chilled from it in winter. But wherever persons are to sleep near a roof, thatch well ceiled is the most comfortable,

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as it preserves the room in an even temperature. Landlords intent on making comfortable cottages will, he thinks, often find it best to build or repair before they engage with a tenant; for men not used to improvements, cannot comprehend effects before hand, and they will apprehend want of accommodation without reason, or oftentimes if attended to lose the conveniences they would have wished; or they will not wish for those, in which it is best they should be indulged. For instance, windows to open will not always be desired. He thinks it perfectly possible to improve men in their turn of mind, by giving them properties in and about their habitations which they may not have thought of or desired.

In the first volume of Communications to the Board of Agriculture it has been remarked by Mr. Holland, that "building cottages must be attended with more or less expence, according to the facility with which materials can be procured, and the price of labour; and in some measure upon the foundation that may be required, and the labour necessary to form the level on which they are to stand; but supposing no extraordinary expence, the estimate will stand, he thinks, thus:

	<i>l.</i>	<i>s.</i>	<i>d.</i>
18 yards digging the foundation and levelling the ground, at 3d per yard,	0	4	6
160 feet of reduced brick, rough stone, or flint in the foundation, and one foot above ground, taking an average price, brick will probably be the dearest. When flint or rough stone is to be got, the least expence is to lay it in dry, and run liquid mortar, or, as the workmen call it, <i>groat</i> , to fill the interstices, and cement the work. It was thus the old hard walls, of which great remains are still to be seen, were constructed; at 6d. per foot, 2½ inches thick,	4	0	0
170 feet of reduced brick work to the chimney and chimney shaft, at 8d. per foot.	5	13	4
608 feet superficial of earth or mud-walling, 20 inches thick, at 3d. per foot,	7	12	1
1 square, 66 feet superficial, of flooring to the kitchen, if of earth, at five shillings per square,	0	8	3
78 feet of flat brick paving, laid dry in the pantry, at 3d. per foot,	0	19	6
11 feet 3 inches of clammy earth paved with brick an edge, in mortar, at 6d. per foot,	0	5	7½
33 feet of brick foundation to the privy, nine inches thick, and two feet deep, open towards the dung hill, at 6d. per foot,	0	16	6
15 feet cube in a small brick sink in the pantry, raised two feet six inches above the floor, the run from it to the yard and privy, at 9d. per foot,	0	11	3
16 feet run of brick gutter across the yard, at 3d per foot,	0	4	0
40¾ squares of the best reed-straw thatching on the house, including roofing of fir-poles, or rough unseasoned timber, prepared for thatching, at 40s. per square,	9	10	0
3 squares of chamber flooring, timber and boards, at 45s. per square,	6	15	0
3 squares of under-flooring, serving as a security against fire, and a ceiling below, at 20s. per square,	3	0	0
Mantle, tassels, and inside burn to kitchen chimney,	0	8	0
The staircase, one story,	2	10	0
Three brick steps, with wood nettings from the kitchen to the pantry,	0	5	0
The street ledged door, lintels, locks, latch, hinges, and door cases,	0	19	6

The inside linings to ditto.	0	4	0
The ledged door, door-case, lintel, lock, hinges, bolt, latch, and inside linings, from the pantry to the yard,	1	0	0
This door may perhaps be dispensed with in cottages of the smaller size.	-	-	-
The projection on the outside of the street door intended to shelter it from wind and rain, of boarding covered with lead,	1	6	0
No. 5. Inside ledged, deal doors, hinges, latch, and jambs,	2	10	0
No. 4. Casement windows, solid frames, lintel, lead lights, and inside window boards,	4	12	0
Outside fall-down shutter and hinges to one window, fastened with a pin and key,	0	6	0
Wood bars to secure the pantry window,	0	1	6
Outside painting to the window frames, doors, and shutter,	1	10	0
Skirting in the kitchen and two lodging rooms, A dresser and two drawers in the kitchen, with a shelf over it,	3	0	0
Small dresser and shelf in the pantry,	0	7	6
Closet shelves, and two closet locks,	0	13	6
Lath and plaster to the ceilings of the lodging rooms, and partitions,	1	5	0
Rendering against the walls in the kitchen only, The white-washing in the inside, the colouring on the outside, and forming the rustics,	0	15	0
2	2	0	0
Completing the privy above the brick foundation, and covering it with thatch,	3	0	0
Building the hovel covered with thatch, inclosed three sides with slabs, leaving an opening (for pitching fuel or straw, &c.) next the street,	8	10	0
Fencing next the street, and small gate, &c.	2	5	0
Total estimate for one cottage,	£	80	0 0 ½

"The fencing to the garden, as well as making it, are not considered, as it must vary considerably in every situation. The supply of water is a sort of general concern, of which it is difficult to say how much will attach to a particular cottage.

"This estimate is for a cottage of the smallest size. Perhaps buildings in the country may, he says, be thus divided, increasing in size and expence according to the order in which they are named.

"Cottage, smallest size, for the labourer."

"Second size for the labouring man, who, by his skill and working task-work, earns more than the common labourer.

"Cottage, third size, for the village shopkeeper, shoemaker, taylor, butcher, and baker.

"Cottage, fourth size, for the [farmer, ma'tler, small farmer, alehouse, and trades requiring room.

"Cottage, fifth size, for the large farmer, generally called a farm-house, suitable to the most improved system of farming, but nevertheless partaking of the general principles already laid down. The expence of all such buildings will depend not only on the facility of procuring labour and materials, but on the economy and management of those who direct, and those who undertake the construction of them. It is not the least merit of the proposed plan," he observes, "that the cottages of the smallest may be executed with the refuse of greater works, the "crumbs from the rich man's table," and that the materials are nearly all neither taxed nor taxable."

Mr. Kent in his "Hints on Landed Property" has likewise given

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given many useful estimates concerning the building of cottages on different plans.

In a series of plans for cottages by Mr. J. Wood, much light has been thrown on the construction of habitations for labourers, and the following seven principles laid down, as the means of obviating any inconveniences to which cottages, as usually built, are liable :

“ 1st. The cottage, says he, should be dry and healthy ; this is effected by keeping the floor 16 or 18 inches above the natural ground ; by building it clear of banks, on an open spot of ground, that has a declivity or fall from the building ; and by having the rooms not less than eight feet high, an height that will keep them airy and healthy.

“ 2dly. They should be warm, cheerful, and comfortable. In order to attain these points, the walls should be of a sufficient thickness (if of stone, not less than 16 inches ; of brick, at least a brick and a half) to keep out the cold of the winter, or the excessive heat of the summer. The entrance should be screened, that the room, on opening the door, may not be exposed to the open air ; the rooms should receive their lights from the east or the south, or from any point betwixt the east and the south ; for, if they receive their light from the north, they will be cold and cheerless ; if from the west, they will be so heated by the summer’s afternoon sun, as to become comfortless to the poor labourer after a hard day’s work ; whereas, on the contrary, receiving the light from the east or the south, they will be always warm and cheerful. So like the feelings of men in a higher sphere, says the writer, are those of the poor cottager, that if his habitation be warm, cheerful, and comfortable, he will return to it with gladness, and abide in it with pleasure.

“ 3dly. They should be rendered convenient, by having a porch or shed, to screen the entrance, and to hold the labourer’s tools ; by having a shed to serve as a pantry, and store place for fuel ; by having a privy for cleanliness and decency’s sake ; by a proper disposition of the windows, doors, and chimneys ; by having the stairs, where there is an upper floor, not less than three feet wide ; the rise or height not more than eight inches, and the tread or breadth not less than nine inches ; and lastly, by proportioning the size of the cottage to the family that is to inhabit it ; there should be one lodging room for the parents, another for the female, and a third for the male children ; it is melancholy, he says, to see a man and his wife, and sometimes half a dozen children, crowded together in the same room, nay, often in the same bed ; the horror is still heightened, and the inconvenience increased, at the time the woman is in childbed, or in case of illness, or of death : indeed, whilst the children are young, under nine years of age, there is not that offence to decency, if they sleep in the same room with their parent, or if the boys and girls sleep together, but after that age they should be kept apart.

“ 4thly. Cottages should not be more than twelve feet wide in the clear, that being the greatest width that it would be prudent to venture the rafters of the roof with the collar pieces only, without danger of spreading the walls ; and by using collar pieces, there can be 15 inches in height of the roof thrown into the upper chambers which will render dormer windows useless.”

“ 5thly, Cottages should be always built in pairs, either at a little distance from one another, or close adjoining, so as to appear one building, that the inhabitants may be of assistance to each other, in case of sickness, or any other accident.

“ 6thly, As a piece of economy, cottages should be built strong, and with the best of materials, and these ma-

terials well put together ; the mortar must be well tempered and mixed, and lime not spared ; hollow walls bring on decay, and harbour vermin ; and bad sappy timber soon reduces the cottage to a ruinous state ; although he would by no means have the cottage fine, yet he recommends regularity, which is beauty ; regularity will render them ornaments to the country, instead of their being, as at present, disagreeable objects.

“ 7thly, A piece of ground should be allotted to every cottage, proportionable to its size ; the cottage should be built in the vicinity of a spring of water—a circumstance to be much attended to ; and if there be no spring, let there be a well.

“ On the foregoing seven principles, Mr. Wood recommends all cottages to be built. They may be divided, he thinks, into four classes or degrees ; first, cottages with one room ; secondly, cottages with two rooms ; thirdly, cottages with three rooms ; and, fourthly, cottages with four rooms :” plans of each of which, which have great merit in the form of their distribution, may be seen in his very able work ; and also in the annexed plate.

It has been well observed by the author of the Shropshire Report, “ that general rules are to be cautiously received, and sparingly followed ; that local situation may make this or that place the best. For instance, many old houses, especially if framed together with timber, are worth repairing, though the outward appearance may bespeak a great deal of wretchedness or decay, for they can generally be made more comfortable than a new house, and at less expence. He is much more anxious that houses of this description should be kept in clean and good repair, than to prescribe any particular form. He would only suggest the impropriety of making them, or indeed any other object, bear an outward appearance, intended to contradict their inward use. All castellated or gothicised cottages, all church-like barns, or fort-like pig-styes, he should conceive to be objectionable. They are intended to deceive, and they tell you that they are intended to deceive. It is not pleasant to encourage any thing like deceit ; but in these instances, imposition effected is rarely gained ; it amounts only to imposition attempted ; and could the deceit succeed, would only present a prospect with fewer properties about it, than there really are. Almost every species of country building has a good effect if properly placed, and neatly executed ; and what are the least ornamental, or indeed the most disgusting of their appendages, cease to shock when supported by the relative situation they stand in, shewing their necessity and their use. A dunghill in a farm-fold, creates no disagreeable idea ; but, connected with a gothic gateway, or embattled tower, it is bad. Cattle protected by the side of a barn, form a picturesque group ; but, sheltering under a Grecian portico, the impropriety is glaring. Linen hanging to dry on the hedges of a cottage garden, may be passed without displeasure ; but the clothes of men, women, and children, surrounding the cell of an anchorite, or the oratory of a monk, have their natural unseemliness increased by the contrast. On the other hand, a fine dressed lawn, with miserable cottages on the outside, may be compared to the laced cloaths and dirty linen some foreigners were accused of wearing. The whole of a gentleman’s estate should be his pleasure ground ; the village should be one object in the scene ; not shut out from it. There may be a little more polish about the mansion, but it should not be an unnatural contrast to the surrounding objects. The face of no country is bad, but as it is disfigured by artificial means ; and the cheapest and best improvement is, merely

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to remove what offends, and to take care that the buildings or fences that are wanted, are neat and appropriate, exhibiting distinctly the real intention."

In the following figures are given plans and elevations of some of the most simple kinds of cottages for the labourer, constructed on the principles that have been above laid down, as well as others of the most approved nature. Their roofs are represented as of slate, and other materials; the first being, however, by far the neatest. Their external appearance may be varied in different ways, according to the taste of the builders, and the nature of the situation where they are built, which ought always to be well attended to; for what will have a good effect in one place, or point of view, may not be so striking or pleasing in another; but this will depend greatly on the care and good sense of such persons as are employed in directing the construction of such buildings.

For such small-sized cottages as may be suitable for little estates, issuing out of the allotments of wastes, commons, or other lands of a similar kind, several ground plans and elevations of dwellings, to be built of different species of materials, have been given in the volume of Communications to the Board mentioned above, by Mr. Crocker, an intelligent land-surveyor in Hertfordshire. Some of these are built with mud walls, composed of soft mire and straw, well trodden together, as noticed above, and which, by degrees, is laid on, *stratum super stratum*, to the height required. This is a species of building, he says, which is not uncommon for cottages, and even for better houses, barns, &c. in the western, and some other parts of the kingdom. It is, he adds, the cheapest habitation that can be constructed, and is also very dry and comfortable. There are others which have generally a footing of stone wall, two feet high, on which is placed a strong sill of timber; to which are super-added uprights of quarterings, two feet apart, into which are inserted rounds of rough wood, somewhat like ladder-work, at six or seven inches, one above the other, to the height required. The spaces between the rounds are well filled with a mixture of the above mire and dry straw, previously well trodden together, called *cab-dub*; the whole being then plastered with good mortar, and rough-cast. These kinds of buildings are used where stones are scarce, or where cheapness is the leading object. There are others built with a sort of rough stone masonry, and sometimes fluccoed over; and although they are more expensive than the others, yet they are the strongest and most desirable of any, where such materials are to be had without great expence of carriage.

Circular cottages, upon very simple, cheap, and economical plans, have likewise been lately proposed by Sir John Sixelair, for the purpose of containing farming and manufacturing labourers. These are constructed wholly of brick, the walls and roof together. Where this sort of material can be readily provided, this mode may probably be had recourse to with advantage, as being convenient and durable, and requiring little repairs.

Elevations of the larger sorts of cottages on this plan, are given at *figs. 3 & 6*, in *Plate VIII. of Agriculture*. These are of different dimensions, as shewn in the plate. At *figs. 4 & 5* are given plans of the internal parts of the smaller, the former representing that of the room above, and the latter the ground plan. And, at *figs. 7 & 8* are shewn the plans of the upper and lower floors of the larger.

Several other plans of large and small cottages, both of the common and ornamental kind, are contained in the

same plate. At *fig. 1* is given the elevation of a double cottage, or small farm house, which is adapted to numerous cases, and which is capable of being built of rough masonry, at the expence of about 96*l.* or 100*l.*

And, at *fig. 2*, is a representation of the ground plan of the same.

At *fig. 9* is shewn the elevation of a small neat cottage of the common kind, calculated for the ordinary farm labourer. And, at *fig. 10* is given the elevation of another small cottage, with two rooms, on a more enlarged and ornamental plan, but suited to a variety of cases.

At *fig. 11* is the elevation of a cottage, recommended by Mr. Crutchley, with three rooms and a lean-to, and which, from the number of its conveniences, is considered by cottagers in general, as well adapted to their purposes; but even when built with mud walls, with its various comforts, it cannot be erected for less than about forty pounds.

The ground plans of these three last cottages have not been given, as the internal divisions may be so contrived as to suit the particular purposes of the builder.

Fig. 12 exhibits the elevation of two cottages built together, the vents being made in the partition wall between them.

And, at *fig. 13*, is seen the ground-plan of them; A A, stairs to upper-chamber; B B, pantries or milk-houses; C C, ovens.

This is probably the cheapest plan on which small cottages for labourers can be built.

Fig. 14 is the elevation of two cottages built together, on a small somewhat ornamental plan, designed by Mr. Wyatt for Lord Penrhyn, at Winnington in Cheshire. Cottages erected on this plan have much effect in many situations, and are capable of being raised at no very great expence.

COTTAGE Farm, in *Rural Economy*, a name which has lately been given to the small allotments of land which are frequently attached to the cottages of the better kind. This is a practice which prevails in some districts, it is said, with considerable advantage to the labourer, in rendering him more comfortable and industrious, as well as in facilitating his means of supporting his family. It is a system of cottage management which the earl of Winchelsea has introduced pretty extensively in the county of Rutland. And it is remarked on the authority of Mr. Barker of Lyndon, in the same district, in support of the utility of the plan, that "most of the poor people of that parish keep cows; one or two, or three to a family, which is a great advantage to them; so that it can hardly be said there are any industrious persons there who are really poor, as they are in some places where they have not that advantage. It has been the practice in that place time out of mind. They have a ground called the Cottager's Close, wherein the poor, for an easy rent, keep 18 cows, and Mr. Barker supposes it was laid out for them at the inclosure of the lordship in 1624. On that close, he says, the cows go from May-day till St. Andrew's; and in winter, they take them into their home-steads; and while several neighbouring lordships were open-field, they could buy hay reasonably cheap to feed them with at that season; and we have several little takes, of a few pounds a year, rented by the cottagers; and he has made some new ones; for, since the inclosure of those parishes, hay is grown very dear, and is scarcely to be had at all. He conceives it always was the custom for every one to keep a milch-cow, who could raise money enough to buy one, and could get keeping for it. He supposes it was so in this

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parish long before it was inclosed. He thinks there are cottagers who have a right of common in Hambleton cow-pasture; but supposes his lordship must know that matter better than he does. There are little estates, and cottagers who have a right of common in North Luffenham cow-pasture. There were persons at Edith, Welton, who had such before the inclosure, and he believes it was the same in other towns also; but he is sorry to say, that he is afraid most of those cottages were taken away at the time of the several inclosures, and the land thrown to the farms; wherein he conceives they did very wrong; but they have, he says, an instance of a new inclosure where that good old custom is still retained, as Sir John Rushout has made a considerable number at Ketton: he believes the cow-pasture, and ploughing-land to each cottage, are four acres. He wishes that parliament would make it a rule never to grant an inclosure, without a close laid out for the benefit of the poor."

And his lordship states, "that upon his own estate, the custom is, he believes, of the greatest antiquity; he has labourers, tenants, in whose families the lands they now occupy, have been for near two hundred years; and they have, as far as he can learn, been generally good labourers, and received no relief from the parish. He has made several new takes of that sort, and has always found them to answer. And that, with regard to manuring their meadow-ground, by keeping their cows in hovels during winter, and by keeping a pig or two, which they generally do, they contrive to make manure; their employer generally sells them, or gives them, a small quantity of straw, and sometimes they procure fern, or collect weeds."

In fact, it is conceived that "the situation of labourers may be classed in this way:

"1st, Those who have a sufficient quantity of grass inclosed land, to enable them to keep one or more cows winter and summer, and a garden near their house.

"This is, in his opinion, the best situation for a labourer, as excepting the hay-making, the rest of the business is done by himself and his labour is not interrupted. Where a grass field is allotted to a certain number, and each have a field for mowing near their house; or where there are two fields, one grazed, and one mown, alternately, and properly stinted, it will be as advantageous, or nearly so, as having small inclosures to themselves." But he supposes it "can only take place in countries where there is abundance of grass land.

"2dly, Those who have a summer pasture for their cow, and some arable land upon which they grow the winter provisions."

He thinks, that "this is not so advantageous as No. 1, because more of their time is taken up by the arable land; however as they must, in order to make any hay, have part of the land sown with grass, the labour is not so much as to be hurtful to them. He has several such upon his estate, which answer very well. This is adapted to countries where there is a mixture of pasture and arable;" he supposes.

"3dly, Those who have a right of common for the summer keep of the cow, and a meadow, or arable ground, or a meadow in common, for the winter provision." And, "this would," he thinks, "be like the two former, were it not that nine commons out of ten are so much overstocked, that the summer keep is very bad. This is a very great loss; and if the meadow is in common, it is another disadvantage. It is certain, that upon an inclosure, if the owners choose it, the labourers who keep cows may be placed

in a much better situation than they were in, as much as inclosed land is more valuable to occupiers of every description, than commons and open fields. Garden ground may also be allotted to them, and others, which cannot be done while the land remains uninclosed. He is persuaded, that where these things are attended to, very few objections to an inclosure will arise on the part of the labourers, and that the land owners will have the satisfaction of benefiting the poor; and at the same time of making their own property more valuable, by adopting what in all probability will be the means of keeping down the poor's rate. He supposes that gardens near the houses to all these should not be the case, as they have land, they may have garden stuff; but if their land is at a distance from their houses, it is not so advantageous; and if their take is all grass, they can find no ground to dig, except, perhaps, where a haystack has been placed the preceding year.

"4thly, Those who have a right of common, and a garden. This is certainly very beneficial to them; geese and pigs may be kept upon the common, and the latter fed with the produce of the garden, and a small quantity of purchased food.

"5thly, Those who have a right of common, and no garden." He imagines, that "this, unless fuel is obtained, is of no great value to them; if fuel is obtained, it is of great value, and the loss of it difficult to be made up to them.

"6thly, Those who have several acres of arable land, and no summer pasture for a cow. This is," he believes, "of no sort of use to the labourer; for though he may cultivate part of it as a garden, the continued labour it would require to stall-feed a cow, winter and summer, and the quantity of land he must till, would occupy so much of his time, that the take would, upon the whole, be injurious to him, even supposing the land inclosed, and contiguous to his house; if at a distance, or not inclosed, the disadvantage would be still greater. He is sorry to differ in opinion upon this subject from Mr. Barclay, but perhaps, in other parts of the island, his plan of a take entirely arable, might answer. He is persuaded it would not, in the parts he is acquainted with, and that the farmers would not sell them hay, which is a part of his plan. He believes, that a summer pasture for the cows is absolutely necessary to make it of advantage to the labourers who keep them.

"7thly, Those who have a garden near their house." He asserts, that "this is the best thing that can be done for labourers in arable countries, and where there are no other reasons which prevent them from keeping cows."

It is here remarked, "that as the land cultivated as a garden, will produce a greater quantity of food for man, than in any other way, and as four-fifths of the labour bestowed upon their gardens, will be done by the labourers at extra hours, and when they and their children would otherwise be employed, it may not be too much to say, that 100,000 acres allotted to cottages as garden-ground, will give a produce equal to what 100,000 acres cultivated in the ordinary way would give, and that without occupying more of the time they would otherwise give the farmers who employ them, than the cultivation of 20,000 acres would require.

"8thly, Those who have no land whatever. This," it is observed, "is a very bad situation for a labourer to be placed in, both for his comfort and for the education of his children. When a labourer is possessed of cattle, his children are taught early in life the necessity of taking care of them, and acquire some knowledge of their treatment;

and if he has a garden, they learn to dig and weed, and their time is employed in useful industry; by which means, they are more likely to acquire honest and industrious habits, than those who are bred up in poverty and laziness we too often see; for he believes it is a certain fact, that extreme poverty begets laziness."

On these grounds he is "clearly of opinion, that the letting land to labourers is of great utility both to them, to the land-owners, and to the community; for though in every village some idle people will be found, who are not fit to be entrusted with, or capable of receiving benefit from land, still the greater number will; and it may have the effect of making those industrious who would not otherwise have been so. When circumstances will admit of it, their having land enough to enable them to keep a cow is the most desirable thing for them; but a very great part of the island will not, in his opinion, allow of that system being pursued, where there is hardly any thing but arable land; and also in the neighbourhood of large towns, the value of grass-land is too great, he supposes, to allow of labourers renting it with advantage. A garden may, however, be allotted them in almost every situation, and will be found of infinite use to them. In countries where it has never been the custom for labourers to keep cows, it would, he believes, be very difficult to introduce it: but where no gardens have been annexed to the cottages, it is sufficient to give the ground; and the labourer is sure to know what to do with it, and will reap an immediate benefit from it. Of this he has had experience in several places, particularly in two parishes near Newport Pagnell, Bucks, where there never had been any gardens annexed to the labourers' cottages, and where upon land being allotted to them, they all, without a single exception, cultivated their gardens extremely well, and profess receiving the greatest benefit from them. He begs to observe, that when he mentions cowpastes he always supposes there to be a sufficiency of land to enable the cow to be kept tolerably well, both in summer and winter. If this is not the case, he believes that the cow is but of little benefit to the owner; and when he mentions gardens, he always means large gardens, from half a rood to a rood, or more, if the land is poor. Those very small spots of a few yards square, which are sometimes seen near cottages, he can hardly call gardens. He thinks there should be as much as will produce all the garden stuff the family consumes, and enough for a pig, with the addition of a little meal. He also thinks they ought to pay the same rent that a farmer would pay for the land, and no more. He is persuaded, that it frequently happens, that a labourer lives in a house at twenty or thirty shillings a year rent, which he is unable to pay; to which if a garden of a rood was added, for which he would have to pay five or ten shillings a year more, that he would be enabled, from the profit he would derive from the garden, to pay the rent of the house, &c. with great advantage to himself.

"It is supposed that not a little difficulty is thrown in the way of the introduction and establishment of the cottage-farm plan by the inattention or disinclination of farmers to countenance such a practice. Under the present circumstances of the increasing wages and expences of farm servants, it is, however, obviously their advantage to encourage them as much as possible;" as is shewn in speaking of cottage and cottager. See COTTAGE and COTTAGER.

It has likewise been stated by the writer of the "General View of the Agriculture of the County of Salop in respect to this practice, that "a labourer's fields should be chiefly confined to pasture, that the care of them may not

interfere with his working for hire. The number of acres necessary will depend upon the nature of the land. He has not found six acres to interfere at all materially with a labourer's work; and if he is fit to be trusted with land at all, he should have at least three acres, where the situation of his house will admit of so much; for unless the ground joins the house it cannot be looked after without loss of time; and it will generally prove a nuisance to the neighbours, or the public. In addition to the situation of a cottage, the tenant's character and circumstances must be well considered. Where it is convenient or advisable to let him have land enough for a cow, he may have a larger garden, and the necessary and pig-stye should be so placed, that the soak from them may be directed to manure the soil. The pig-stye should have a small court, to open into the garden only. When a pig is bought it is small, and may be carried to the stye, where it may remain. He has found this the only way of preventing the pigs from wandering about the village. If the stye opens to a road it will never be so well guarded as when the first act of trespass must be on the owner's garden."

It is however added by the intelligent author that "he is truly anxious, under all proper restriction and limitations, of advancing and recommending the practice of setting some land to labourers and country mechanics. It appears to him important, both in a moral and political point of view. Let us consider," says he, "in the first place, the probable effects of such situations being more easily attained. Would not farming servants, both men and women, have an additional motive to be careful, and seek after matrimonial, instead of illegal, engagements, if they knew that, when they could save money enough to buy a bed, a pig, and a cow, they might settle and have a house and land for which they could afford to pay rent, and from which they could hope to maintain themselves and rear a family? Or, if they have not money enough to buy all their stock at first they may raise potatoes in one year, sufficient to increase their capital. Let us now consider them placed in their cottage. The care of the land is not sufficient to take the labourer off from a single day's work; but when it is six o'clock in the evening, he has an interest in going directly home, to see that his fences are in repair, or to dig a part of his garden, &c. he knows too that when he has done this (or if the weather is too bad for him to remain out of doors, still he knows,) that his house is warm, and that his supper is preparing; for his wife has been at home the whole day, looking occasionally after the cow, feeding the pig, weeding in the garden, or spinning in the house. As her family grows up, she can put the elder children to do some of these things; but if the woman goes out to work, the children are neglected, and the house is cold and comfortless; and the husband has a temptation to go to the ale-house (though this evil is much lessened, from the high price of necessaries, and in some districts, from the reduced number of public-houses). Before men can be made good, he observes, they must be made serious, and this is best by giving them an idea of propriety. From being serious, there is a chance of their becoming good members of society through principle; but if not, they may be harmless through interest; and we cannot conceive a stronger support to the police of any county, than the householders of it having business of their own to mind, and property of their own to defend. Though the rent of a cottage is generally an inadequate interest for the money spent in building or repairing it, yet the tenant is frequently willing to pay a higher proportionate rent *per* acre for land than the farmer does, and he is also frequently

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the most punctual in the payment of his rent. But, however the balance may be in other respects, one considerable advantage will," he thinks, "always be derived from the extension of this plan, in the reduction of the poor-rates. If, indeed, the 31 Eliz. c. 7. could have been acted upon, or modified, rather than repealed, it may have prevented the expence of poor-rates in the country parishes. It prohibited the building of any cottages in the country, unless there be set four acres of land, lying near the same, to be continually occupied therewith, &c. &c."

And in farther proof of the utility of the practice, the same writer adduces, on the authority of a letter from the Rev. A. Allison, rector of Kenley, the following interesting facts.

"With regard to the experiment in this parish," says the rector, "it is much too trifling and too recent to deserve any attention. Thirty acres were allotted to me in the division of the common, and they were divided into ten shares, to accommodate the poor people of the common who had the largest families, at the same rent that was paid for the other part. It is only three years since this took place, and he can say little, therefore, with respect to the effects he most wished to follow from it. That it has added to the comfort of the people in that time he has every reason to believe, both from their own acknowledgments, and the anxiety of the rest to possess the same advantages. He thinks he may say also, that it has added, in some measure, to their industry. The land in general is in a better state than any of that which was inclosed at the same time. The poorest amongst them have all carried lime, collected road-stuff, burnt weeds, &c. and some of them have certainly manured higher than any of the farmers in our parish. Two of them have built cottages at their own expence, and shewn a little disposition to ornament, by white-washing them, &c. In so short a time, these are at least not unpromising appearances. With regard to the quantity of land which may be allotted to cottagers, without diminishing their industry as day labourers, it will not be easy to determine. If he was to judge from this parish, he should be disposed to think that more than three acres might very safely be given. The most decent, industrious, and well-doing of the lower people among us, are four or five families, who have from five to eight, or ten acres a-piece. This does not prevent them from working constantly, either as labourers or in their trades. They have brought up families without any parish assistance, and their children are in general better educated, better behaved, and set out better in the world, than any others of the same rank among us. These little farms, indeed, are always in grass, as he apprehends they will always naturally be, when not exceeding these limits. The smaller farmers with us, of from 20 to 30 acres, who are induced to keep something like a team, are much the poorest and most wretched people among us."

It is added still farther by the author of the report, that "in setting these allotments at the current price, viz. 7s. per acre, it was promised not to raise that rent in consequence of any improvements the original tenants may make, which would have the operation of a lease for the time of his incumbrances. A farther promise also was holden out, that a jury of farmers should look over the ten allotments annually, and he who had improved the most should be excused paying rent for that year. It should be noted also, that lime is within a few miles of these cottages."

And in a farther communication from Mr. Harries, an intelligent and able cultivator of extensive property, it is observed "the building should be of a dimension to allow

two separate chambers. An acre of ground annexed to it, would admit of half being annually sown with wheat, the other half with hemp, potatoes, cabbages, and beans; these would be a great assistance to the labourer in support of his family; they would enable him to keep and fat a pig. This situation would be still more comfortable if five acres of land were added to it, as he could then keep a cow, and somewhat increase his quantity of grain. A double cottage he would generally recommend: there is some saving in the erection, and they may mutually assist each other, for though violent quarrels sometimes arise between such neighbours, yet reciprocal interest soon occasions a forgetfulness of past offences. He thinks there are more small habitations of this kind in this county, than in any other within his observation. There should be at least two cottages to every 100 acres. The situation open to a public road, dry, and south, or south-east."

Those who are anxious to have more full information on the advantages of this sort of small farms, may find much that will interest them in an excellent paper on the subject in the thirty-seventh Volume of Mr. Young's "Annals of Agriculture."

And with the view of rendering the introduction and establishment of the cottage farm system, more easy, as well as removing the different objections which have been urged in opposition to it; the plan and arrangement given below have been brought forward by Sir John Sinclair in an interesting paper inserted in the fourth volume of "Communications to the Board of Agriculture." In this paper the following principles are chiefly kept in view:

1. "That the cottager shall raise, by his own labour, some of the most material articles of subsistence for himself and his family.

2. "That he shall be enabled to supply the adjoining markets with the smaller agricultural productions; and

3. "That both he and his family shall have it in their power to assist the neighbouring farmers at all seasons of the year, almost equally as well as if they had no land in their occupation."

The writer supposes that "it can hardly be questioned, that if it were practicable to have a number of cottagers of that description, in every parish, it would promote, in various respects, the interests of the public."

With respect to the extent of ground, which is necessary, he says, "unless the experiment were fairly tried, it is impossible to state exactly the extent of arable land that may be requisite, to enable a cottager to raise the articles generally necessary for the sustenance of himself and family, and to keep a cow, some pigs, and poultry. Much must depend upon the natural richness of the soil (though under the management about to be proposed, almost any soil would, in time, become fertile); on the nature of the climate; on the size of the cow; on the industry of the cottager; on the age and number of his family, &c. But he should imagine, that three statute acres and a quarter, of good arable land, worth from 20s. to 30s. per acre, would be sufficient. It is proposed, that the three acres shall be under a regular course of cropping. The quarter of an acre ought, if possible, to be converted into an orchard, where the cow might occasionally pasture, and where a pond ought to be kept in good order, that it may have plenty of water at command. Were the land of a quality fit for lucerne, perhaps two acres and a quarter might be sufficient."

It is stated in regard to the implements, "that, so small an extent of land, as either two or three acres, under cultivation, excludes all idea of ploughing; and indeed, unless the cottager shall manage the whole, in the simplest and

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cheapest manner, there is an end to the whole system. It would require, indeed, four or five acres to keep a single horse, and the expence of purchasing horses, or even oxen, ploughs, and other instruments of husbandry, must be far beyond the abilities of a cottager; whereas with a spade, a hoe, a rake, a scythe, a sickle, and a flail, (a wheel-barrow omitted) which are all the instruments really necessary, he is perfectly competent to the management of his little farm." He remarks, that "ploughs might, perhaps, be hired; but, on the whole, the spade-culture is infinitely preferable, and he would much rather see a cottager hire persons to trench, than to plough for him."

In what relates to the course of crops, or the mode of cropping the ground, "the three acres proposed to be cultivated, should, he thinks, be divided into four portions, each consisting of three roods, under the following system of management.

	<i>Roods.</i>
Under potatoes, 2 roods, under turnips, 1	3
Under winter tares, 2 roods, spring tares, 1	3
Under barley, wheat, or oats	3
Under clover, with a mixture of rye-grass	3
	—
Total	12 <i>roods.</i>

The writer would also recommend a small quantity of flax, where the culture and management of the plant were known to employ the females, particularly in winter, and to supply the family with linen.

And, it is further added, that "some recommend the proportion, per acre, to be at the rate of one bushel of rye-grass, to 12½ of red-clover; others, 14½ of red-clover, to half a bushel of rye-grass.

"Other articles besides these might," he says, "be mentioned, but it seems to him of particular importance, to restrict the attention of the cottager to as few objects of cultivation as possible.

"It is proposed, that the produce of the two roods of potatoes, shall go to the maintenance of the cottager and his family; and that the rood of turnips should be given to the cow in winter, and during the spring, in addition to its other fare." It is observed, in "Sir John Methuen Peore's experiments," it was found, that half a rood, or one-eighth of an acre, produced, for several years, as great a weight of potatoes, as was sufficient for a family of four persons. Four acres answered for 131 persons.

"The second portion, sown with tares, (the two roods of potatoes of the former year, to be successively sown with winter tares, and the turnip rood with spring tares), might partly be cut green, for feeding the cow in summer and autumn, but if the season will permit, the whole ought to be made into hay for the winter and spring feed, and three roods of clover cut green for summer feed.

"The third portion may be sown either with barley, wheat, or oats, according to the soil or climate, and the general custom of the country. The straw of any of these crops, would be of essential service for littering the cow, but would be still more useful, if cut into chaff for feeding it.

"The fourth portion, appropriated to clover and rye-grass, to be cut green, which, with the assistance of the orchard, will produce on three roods of land, as much food as will maintain a cow and her calf for five months, namely, from the end of May, or beginning of June, when it may be first cut, to the first of November, besides some food for the pigs. It is supposed, that an acre of clover and rye-grass, cut green, will produce 20,000½ weight of food for cattle. Three roods, therefore, ought to yield 15,000½ weight. A large cow requires 110½ weight of green food per day;

a middling sized cow, such as a cottager is likely to purchase, not above 90½, consequently, in five months, allowing 1320½ weight for the calf and the pigs, there will remain 13,680½ for the cow. Were there, however, even a small deficiency, it would be more than compensated by the rood of land, proposed to be kept in perpetual pasture, as an orchard."

It is remarked, that the above "calculations are merely given as data for experiment. It must depend upon the season, whether the tares or the clover should be made into hay."

On the manner of keeping the family, it is, he says, "calculated, that three roods and eight perches of potatoes, will maintain a family of six persons, for about nine months in the year; but, according to the preceding plan, it is proposed to have but two roods under that article, for, however valuable potatoes are justly accounted, yet some change of food would be acceptable, and the cottager would be enabled, from the produce of the cow, and by the income derived from his own labour, and from that of his family, to purchase other wholesome articles of provisions."

And, that in regard to the feeding the flock, "it appears from the preceding system of cropping," he says, "that ten roods of land, or two acres and a half, are appropriated to the raising of food for the cow in summer and winter, besides the pasture of the orchard; and unless the season should be extremely unfavourable, the produce will be found not only adequate to that purpose, but also to maintain the calf for some time, till it can be sold to advantage. It is indeed extremely material, under the proposed system, to make as much profit of the calves as possible, as the money thus raised, will be a resource, enabling the cottager to replace his cow, when a new one must be purchased. And for the winter provision of the cow, which is the most material, because summer food can be more easily procured, there is the produce:

1. "Of about three roods of tares made into hay.
2. "Of three roods of straw, deducting what may be necessary for litter; and if dry earth be put into the cow's hovel, and removed from time to time to the dunghill, little or no litter will be necessary.
3. "Of one rood of turnips.

"The whole being sufficient for seven months in the year, namely, from the 1st of November to the 1st June; and during the remaining five months, the pasture of the orchard, some of the winter tares, and the produce of three roods of clover and rye-grass, will not only suffice, but will furnish a surplus for the calf, if it is kept for any length of time, and some clover for the pigs." He observes, that in a pamphlet just published on the culture of potatoes, by Richardson, the following mode of applying the refuse potatoes, to the feeding of calves, is strongly recommended.

"Take two gallons of small potatoes, wash them clean, put them into a pot of boiling water sufficient to cover them, and let them boil till the whole become a pulp; then add more water, and run the whole through a hair sieve, which will produce a strong nutritive gruel. At first, use a very small quantity, warmed up with milk, to make it palatable to the calf, and increase the quantity daily, till it becomes equal. A quart of potatoe gruel, and a quart of scalded skimmed milk, will be sufficient for a good meal, which should be given warm three times a-day."

"The inferior barley, potatoes, &c. will, of course, be given to the pigs and the poultry."

On the value of the produce, it is observed, that "the land thus managed will certainly produce, by the means of the extra industry of the family, and at a small expence, a most

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a most important addition to the income which the cottager may derive from his ordinary labours. For instance,

	<i>£.</i>	<i>s.</i>	<i>d.</i>
1. The orchard (after the trees become fruitful) will probably yield per annum	1	10	0
2. Three roods of turnips and potatoes	4	0	0
3. Eighteen bushels of barley, at 4 <i>s.</i>	3	12	0
4. The cow and calf	7	0	0
5. Hogs	3	0	0
6. Poultry and eggs	2	0	0
Total	21	2	0

He says, that "according to Mr. Kent's calculations, a cow should produce six quarts of milk per day, worth 1*d* per quart, equal to 3*s.* 6*d.* a-week, or 9*l.* 2*s.* per annum, setting the profit of the calf against the loss sustained when the cow is dry: but it is better to be rather under than over the mark."

And, that "where wheat can be raised, instead of barley, the profit would be still more considerable. Opinions will differ much, regarding the value put on each article, but that is of little consequence, as the total cannot be accounted too high."

In respect to the time required for cultivating the land, it is supposed, that "the quantity of land intended to be cultivated, will not materially interfere with the usual labour of the cottager. It will only require to be dug once, and is then fit to be cropped. It is proposed, that only nine roods should be annually cultivated, (the remaining three roods being under clover and rye-grass) and nine roods may be dug in the space of about 558 hours, or at the rate of 62 hours per rood. This might be done at bye hours, (more especially when the family of the cottager shall be somewhat advanced, and consequently more able to furnish assistance), but supposing that the digging, manuring, harrowing, &c. will require twenty entire days, per annum, in addition to the bye hours, and allowing sixty days for Sundays and holidays, there will remain 285 days for the ordinary hand labour of the cottager, which, at 1*s.* 6*d.* per day, would amount to 21*l.* 7*s.* 6*d.*; the earnings of the wife and children, may, at an average, be worth, at least, 4*l.* per annum more. This is certainly a low calculation, considering how much may be got during the hay and corn harvests; but even at that moderate estimate, the total income of the family will be as follows:

	<i>£.</i>	<i>s.</i>	<i>d.</i>
1. Produce of the farm	21	2	0
2. Labour of the cottager	21	7	6
3. Earnings of the family	4	0	0
Total	46	9	6

With regard to the buildings, "it is impossible," he says, "to calculate the expence of building a cottage, as so much depends upon its size, the place where it is to be situated, the materials of which it is composed, the price of labour in the country, and a variety of other circumstances. On this important subject, much useful information is given above in speaking of cottages." See COTTAGE. "But it is proper," he thinks, "to observe, that no expensive additional buildings will be necessary, in consequence of the proposed system. A shed or hovel for the cow cannot occasion any additional charge, and a small barn, of the simplest and cheapest construction, may be of use, not only for thrashing the crop, but also for securing the hay, and making it to more advantage, in case the season should prove unfavour-

able; if the corn is put up in small stacks, the barn may be made of very moderate dimensions."

In relation to the rent, and balance of income, he remarks, that "the rents of cottages and of land vary so much in different parts of the kingdom, that it is difficult to ascertain an average; but if the cottage shall be slated at 3*l.* per annum, the land at 25*s.* per acre, and the orchard at 10*s.* the whole will not exceed 7*l.* 15*s.* The cottager will also be liable to the payment of some taxes, say to the amount of 1*l.* 5*s.* more. Hence the total deductions would be about 9*l.*, leaving a balance in favour of the cottager of 37*l.* 9*s.* 6*d.* Considering the cheap rate at which he is furnished with a quantity of potatoes equal to several months consumption, and with milk for his children, surely with that balance he can find no difficulty not only in maintaining himself and family in a style of comfort, but also in placing out his children properly, and laying up a small annual surplus, that will render any parish assistance, whether in sickness, or old age, unnecessary; and thus he will be enabled to preserve that manly and independent spirit, which it so well becomes a British cottager to possess." But he here observes, "that the different expence of fuel in the various districts, will, it is evident, greatly affect the annual surplus."

In regard to the advantages of the proposed system, he concludes, "the advantages which may be looked for with confidence from the proposed system, are that, in the first place, the land possessed by the cottager would be completely cultivated, and rendered as productive as possible. The dung produced by the cow, the pigs, &c. would be amply sufficient for the three roods under turnips and potatoes, which would afterwards produce, 1*½* tares, 2*d* barley, and 3*d* clover, with a mixture of rye-grass in regular succession, without any additional manure. The barley should yield at least 18 bushels, besides 3 bushels for seed; and, if wheat or oats are cultivated, in the same proportion. The milk, deducting what may be necessary for the calf, and the cottager's family, might be sold in its original state, if there should be a market for it, or converted into butter, for the purpose of supplying the neighbouring towns or villages. Such cottagers also, might certainly send to market both eggs and poultry." And that "2. It is hardly possible to suggest a measure more likely to promote the benefit of a numerous and valuable body of people. The system of keeping cows by cottagers which has been found so advantageous in the grazing districts, may thus be extended over the whole kingdom; and indeed, if the above plan is found to answer in place of four or five acres employed in feeding a single cow, it would be much better, even in the grazing counties, to restrict the land to a smaller quantity, under a tillage mode of management; for thus, not only the cow, but also the cottager himself and his family, would, in a great measure, be maintained by a less surface of soil." And, "3. It is supposed of infinite consequence to establish the practicability of this system, as the means of removing a most unfortunate obstacle to the improvement of the country. It is well known to be the only popular objection to the inclosure of our wastes and commons, that, while uninclosed, a number of cottagers are enabled to keep cows, by the means of their common rights, and that their cows disappear when the commons are inclosed. But if so small a portion of land as 3*¼* acres, when improved and properly cultivated, can enable a cottager to keep a cow, even to more advantage than with a common-right, which can hardly be doubted, as he is enabled to provide winter as well as summer food, there is an end to that obstacle to improvement. Indeed, if sufficient attention be paid to the principles above detailed, the situation of the cottager, in-

stead

COTTAGE.

stead of being deteriorated would be materially bettered by the inclosure; and his rising family would be early accustomed to habits of industry instead of idleness and vice."

The ingenious author concludes with asking, "if any one can figure to himself a more delightful spectacle, than to see an industrious cottager, his busy wife, and healthy family, living in a comfortable house, rented by himself, cultivating their little territory with their own hands, and enjoying the profits arising from their own labour and industry? or whe-

ther it is possible for a generous landholder to employ his property with more satisfaction, or in a manner more likely to promote, not only his own, but the public interest, than by endeavouring to increase the number of such cottagers, and encouraging, by every means in his power, the exertions of so meritorious, and so important a class of the community."

This interesting system of cottage-farming has been reduced into a tabular form, in the manner given below :

Plan of Cottage-Farm, showing the Rotation of Crops in the different Lots.

Cottage.	The orchard, or perpetual pasture.	Pond.
	Lot A, 3 roods.	Lot B, 3 roods.
	1 year—2 roods potatoes, 1 rood turnips.	1 year—2 roods winter tares, 1 rood spring tares.
	Lot C, 3 roods.	Lot D, 3 roods.
	1 year barley, wheat, or oats.	1 year clover and rye grass.

The Rotation of Crops for four Years.

Years	Lot A.	Lot B.	Lot C.	Lot D.
1	Potatoes and turnips	Winter and spring tares	Barley, wheat, or oats	Clover and rye-grass
2	Winter and spring tares	Barley, wheat, or oats	Clover and rye-grass	Potatoes and turnips
3	Barley, wheat, or oats	Clover and rye-grass	Potatoes and turnips	Winter and spring tares
4	Clover and rye-grass.	Potatoes and turnips.	Winter and spring tares.	Barley, wheat, or oats.

"The rotation then begins as at first, lot A, might continue in natural grass the first season, and diminish the labour of that year."

It is stated, that "the exact period when the different crops should be dug or sown cannot be ascertained; because it varies so much in different counties, and depends upon the seasons: but according to the above relation, the labour of digging the various crops is diversified as much as possible, so as not to interfere materially with the other occupations of the cottager. At no period would it be necessary for him to do more than two roods in a month: and both he and his family will labour with much more satisfaction and dispatch, when they work for themselves than for another. In case of necessity, the cottager might hire some of his neighbours in digging, which would be much better than hiring a plough. If a cottager under this system could not work as a common daily labourer, he might, at least, answer as a useful labourer by the piece."

It is evident, that should this system of cottage-farming be found to answer the intention on sufficient experience, it might, by due regulation in what respects situation, and the method of culture, be capable of equal application on arable as grass land, and by that means be rendered general over

the kingdom, which is a circumstance of the utmost importance. Its great advantage in promoting the comforts of the cottager, increasing his happiness and attachment to his situation, and in rendering him more independent and respectable, has been long known and acknowledged.

COTTAGE Garden, a term applied to such portions of garden grounds as are attached to cottages in some counties. The practice of attaching small portions of land to these has been now found by experience to be of considerable utility to the labourer, as enabling him to support his family with greater ease, and preventing his becoming burthen some to the parish. See *COTTAGE Farm*.

It is remarked by Mr. Rudge, in his excellent "Survey of the County of Gloucester," that most of the cottages in that district "possess, in a greater or less degree, this useful appendage; few, however, in a quantity sufficiently large to effect any great advantage. To what size, indeed, cottage gardens may be extended, with safety to the interests of agriculture, can only be ascertained by long and repeated experiments on a large scale. It has been already observed, that they ought not to be so far extended as to occupy too great a portion of the labourer's time, his attentions being wanted elsewhere. See *COTTAGE*."

"The

C O T T A G E.

“The interval between Lady-day and Michaelmas is,” he says, “the portion of the year in which the labourer will derive spare time from the regular engagements of the day; and nine hours for each week are the full average-leisure that can be admitted on calculation. Of one hundred and eighty-six days twenty-six will be deducted for the Sundays, and during two months at least every hour will be wanted for the harvests, so that the whole which the labourer will be able to employ in his own land, will amount to about two hundred and seventy-three hours, or twenty-two days and three quarters. Supposing the garden to comprehend half an acre, or eighty perch, and that a good workman can dig ten perch per day, it will then require eight full days for digging, and another for planting. When the seeds are properly got in, the remaining time will not be more than enough for weeding, hoeing, digging, and harvesting, exclusive of the assistance which may be expected from the family. From the wife, indeed, no great help can be had, as she will find her time fully engaged in domestic employments; and from the children not much more, since, if they are old enough to undertake any thing of labour, they will be useful to the farmer in various ways, and bring home some pecuniary aid to the general stock: the main dependence therefore is on the labourer himself; and he would probably,” he thinks, “be equal to the management of a garden of this size with ease, if he could employ the quantity of time allowed, on the premised calculation, to the best advantage; but as it consists of fractional parts, and his greatest leisure will be when the spade is least wanted, there will be some difficulty in adapting it to the necessities of his garden. Two-thirds of the seeds and plants will require an early attention; potatoes will bear later planting, and of course suit him better. These difficulties are not insurmountable, and it is probable that half an acre of land may,” he says, “be cultivated as garden, without improperly interfering with regular labour. He should have considerable doubts, as to the practicability of adding an acre more of arable land to the cottage, under any circumstance, with the prospect of advantage, if the fact had not been ascertained from the unquestionable authority of Thomas Escourt, esq. in “An Account of the Result of an Effort to better the Condition of the Poor, &c.” “The scale of the experiment is, however,” he says, “too small to admit a general inference; and the local advantages are such as cannot be presumed upon in many situations. It will, however,” he supposes, “stimulate the efforts of other gentlemen, in imitation of a most laudable example.”

“Rewards, as an encouragement for the best managed gardens, have been proposed. The premium, however, should be given to him who, without diminishing the attention due to the farmer, with the least loss of time, and regular earnings, as well as the least encroachment on Sabbath duties, has cultivated his garden with superior neatness and success. Loss of time is a material consideration, because every day which does not bring in its proper return of money, is really lost to the family, and must occasion a reduction of some articles necessary to their comfortable subsistence.

“The industrious cottager, who has an eye to all these circumstances, will,” he says, “employ in his garden the extra hours, before he begins, and after he leaves off, the regular work of the day. This becomes a real saving, being so much gained from idleness, and so much added to the stock of comforts, which others, under the influence of a lounging and indolent disposition, throw away.”

Therefore, concluding that at present half an acre will

in few instances be exceeded, and that it will be in most cases sufficient for the labour of one man, without interfering with his usual engagements, he shall draw the plan of a cottager's garden, with the probable method of managing it to advantage.

It is, however, previously remarked by the intelligent writer, that “wheat should not be among the productions of small inclosures, because it is a lure to the depredations of small birds; and the trouble of the different processes, before it is ready for the mill, probably overbalances the profit, besides the difficulty of finding manure sufficient to keep the land in a good state of cultivation. Plantations of beans and pease, cabbages, and potatoes, will assist the cottager in the keep of a pig more than any other vegetable. In summer, the refuse of the cabbage, with wash, &c. will be sufficient for food; the straw of the beans and pease, with the haulm of the potatoes, will supply litter; while the less valuable of the potatoes boiled or steamed, the gleanings of the harvest, and a little additional corn, will fatten him. If field peas or beans be cultivated, a part may be gathered green for eating, and the remainder left to ripen for the use of the sive. By this management, manure will be made for the land; as almost the whole of the produce will be again returned to it in the state of dung.

“The ground is supposed to be of good quality, well fenced, and adjoining the house. A small portion may first be allotted to herbs and small seeds; then the remainder parted into three divisions; one for carrots, parsnips, onions, cabbages, borecole, &c.; the second for beans or pease, according to the nature of the soil; and the third for potatoes. The crops should succeed in regular rotation, and the manure always used with the potatoes. The occupier should be supplied with seeds and plants for the first year; after which he may contrive, from his own crops, to keep on a succession, or sell enough for necessary change.

“One third of the ground may,” he says, “appear large for what are usually called culinary productions; but it is of great consequence that a poor man's family should be well supplied with vegetables; and if there be an over-stock, nothing will be lost, as it will afford a present supply for the sive, and will save potatoes for winter use.

“The produce may be calculated as follows:

Beans, after deducting seed for next crop,	4½ bushels.
Potatoes, ditto,	40 bushels.
Cabbages and borecole, besides carrots, &c.	500 plants.

	£.	s.	d.
In money, Beans worth . . .	1	7	0
Potatoes . . .	4	0	0
Cabbages, &c. . .	1	10	0
	6	17	0

“Fruit trees may also be planted,” he says, “in the quarters, and gooseberries and currants on the edges of the borders. Planting fruit trees in the hedges, or even near them, is objectionable, because it furnishes a temptation to theft and plunder, and also the certain cause of injury to the fence. The latter is a consideration of great importance, as a good fence to the cottager is more especially needful, since he is obliged to be absent from home a great part of the day, and sometimes takes his family with him into the fields. During this absence, his garden, unless well fenced, is subject to the inroads of sheep, and pigs, and geese, which are loose upon the common.”

It has likewise been suggested by the writer of the Agricultural

cultural Survey of the County of Hereford, "that of late years a valuable addition has been made to the minor objects of agriculture, by the introduction of *strawberries* in cottagers' gardens. On light soils, when proper care is taken to keep the roots free from weeds, and the plants well watered at the season of blossoming, very considerable profits are derived from this practice. Parts of the waste lands on Aconbury and Shucknell hills, in that district, have been particularly applied to these purposes, with great success, and little trouble. The *red Carolina* or *Bath scarlet*, are," he says, "generally preferred, and their fruit sold readily in July, at 10*d.* per full quart, in the Hereford market."

This is unquestionably an article of culture that demands attention in such situations, as being not only productive, with little labour, but at the same time readily and conveniently disposed of, especially in the vicinity of any large town.

COTTAGE PISE, a name sometimes applied to the buildings of this sort, which have been lately constructed with materials of the rammed earthy kind; a method which has been long employed in France. This is a mode which, when well executed, stands very well, it is said, and is at the same time cheap. All sorts of the stronger loams answer the purpose; and light sandy earths may be rendered suitable, by the addition of a small portion of clay; though perfect clay is not proper for this use, from its not ramming sufficiently hard and compact, and being liable to crack in drying. In this sort of work the chief circumstance to be regarded is, to have these matters subjected to a due degree of compression, either in cases contrived for the purpose, or by means of heavy cast-iron rammers. See **PISE Buildings**.

COTTAGER, a term which is commonly applied to a farming or other kind of labourer, who inhabits a cottage. The inhabitants of this description may in general be considered as of four different sorts: 1. The proprietors of small houses of the cottage kind, either by purchase or inheritance; 2. The proprietors of cottages built by themselves, or with the partial aid of their neighbours, on wastes or commons, at their own expence; 3. The renters of cottages in manufacturing districts and situations; and, 4. The renters of them in small country towns and villages. They are, however, principally the second and last descriptions of these cottagers who are to be considered in this place, as being connected with the proprietors of ground, and the business of the farmer, or the management of land: the first being in some measure independent, so as not to render them objects of parochial attention; while the manufacturing cottagers, from being capable of deriving wages from the different arts in which they are employed, can seldom or never be employed in the culture of ground.

It is obvious that labourers of this description are indispensably necessary to the farmer, and without them much of his business must remain unperformed, and of course much loss be sustained, not only by him, but the nation at large. The objections which have, therefore, been made to the encouragement of this useful class of society, which has been emphatically termed the "nerves and sinews of agriculture," are by no means well founded.

It has been well remarked by Mr. Beatson, in a paper in the first volume of the Communications to the Board of Agriculture, that "nothing is more ruinous to the interests of the farmer, than to keep a greater number of servants than he really has occasion for; yet, in all farms, it is necessary there should be a fixed establishment of servants, in proportion to the extent and nature of the farm. Every

one above that number may," he says, "be considered as a supernumerary, incurring an unnecessary expence of at least fifteen or twenty pounds *per annum*, which will fall very heavy on the profits of almost any farm. This fixed establishment, however, is by no means sufficient to carry on the whole operations of the farm at all seasons of the year. There are certain times and certain operations," continues he, "that require additional hands; and fortunate is the farmer who can, on every such occasion, command a sufficient number of hands to expedite and to accomplish his labours. It generally happens too, that when one farmer has occasion for a great many additional hands, all the other farmers in the neighbourhood have the same. How then," says he, "are his operations, in this case, to be carried on? He must have hands, otherwise he cannot proceed, or, at least, may suffer a very material loss by delay. There are only three sources," he supposes, "from whence he can expect assistance: from town's people (if near a town), from villagers, or from cottagers. The townsman considers himself totally independent of, and unconnected with, the farmer; consequently, whoever gives him the best price, that is, bribes him highest, will purchase his labour: but, as it generally happens that those who will accept a bribe are little to be depended on, high wages, a great bustle, and little work badly executed, are therefore too often the consequence of applying to that source. The villager is also," he says, "independent of the farmer, although somewhat more connected with him than the townsman. His demand, however, may not be so exorbitant; yet, being more accustomed to country labour, he will, no doubt, be of more utility, if he can be prevailed on to give his assistance. But the cottager is," he conceives, "the main resource upon which the farmer can best depend: if, therefore, he is fortunate enough to have several well-peopled cottages upon his farm, he will have little to fear from a want of hands on extraordinary occasions." But he suggests, that "a ready supply of labourers is not the only advantage a farmer may reap from cottagers. He will have, at an easy rate, all the manure they make, except what they themselves may require for their little gardens; and they will often, perhaps, be the purchasers of several commodities he may have to dispose of, and save him the trouble to carry them to a more distant market. They will also sometimes have occasion for an additional quantity of ground, besides their gardens, for which they will perhaps be enabled to give a better rent than even the farmer himself can make of it, by keeping it in his own hands, or than can be expected from those at a distance; for, in general, land is the more valuable to the possessor, the nearer it is to his place of residence; and particularly so to the cottager, who can labour it at his spare hours, or when he is not otherwise employed."

It is likewise further stated, "that a nation is said to be rich in proportion to its population: as," he thinks, "it is in a great measure with an estate, or a farm; for, the more numerous its inhabitants, the more easily will it be cultivated and improved."

It is therefore conceived, that "the erection of cottages is an object of great importance to the farmer as well as the proprietor; but it is necessary for the mutual advantage of both parties, that the landlord and his cottagers should be on the best of terms; that he should regard them as a part of his own family, and that they should look up to him as their best and surest friend and protector. Every cottager should therefore," he thinks, "consider, that in promoting the interests of his landlord, whether the proprietor or tenant

nant of the farm, he is, at the same time, promoting his own; for a landlord has it much in his power to serve and oblige his cottagers in various ways, as they themselves must be sensible of. If, therefore," continues he, "they shew that attachment and preference to his interest, which he has a right to expect, there is no doubt he will do every thing he can to render their situation as comfortable as possible: but as it may sometimes happen that even the favours he may do them are not sufficiently birthing on people of an ungrateful or refractory disposition, perhaps the most effectual way to secure to himself those benefits he is justly entitled to expect from their residence on his farm, would be, it is suggested, to make his rents conditional; that is, in case they do not give their assistance, when wanted in harvest, or any other pressing occasion, they should pay so much more, and the farmer or proprietor to have it in his option to remove them at the first term of Candlemas, or Whit-funday, at which time the produce of the preceding crop will probably be removed from the ground they occupy, and their successor will have time to prepare for the ensuing crop."

If it were "settled on some such terms as these," he conceives, "the farmer would find it greatly to his advantage to have as many cottages on his farm as possible; and if he has a long lease, it would even be his interest to assist the proprietor in erecting new ones, either by driving the materials, or otherwise, as they can agree. In every spare corner, therefore," says he, "of a dry situation, of easy access, well sheltered, and near good water, a cottage should be built, and every encouragement given that can render the cottager and his family happy and comfortable."

It is added, that "in many parts of the kingdom one great obstacle, at present, in the way of settling cottagers, is the poor laws, as they now stand; every cottager and his family being supposed entitled to certain claims upon the parish in which they reside: but this might perhaps," he thinks, "be obviated by passing a law, enacting, that in future, with certain exceptions and provisions, no cottager, or others, shall be entitled to make any such claims; or it might even, in some degree, be fixed by agreement with the cottager, at the time of his taking the cottage, by his entering into an obligation for himself and his heirs to renounce all claims whatever upon the parish. Such a law, or such an agreement, might, in all probability," he supposes, "act as a sort of stimulus to industry; and might induce every father of a family to exert himself to make some kind of provision for his children or widow, in case of his death. Whereas, at present, by far too many take no sort of pains whatever to do so, being prepossessed with the idea, that, if reduced to beggary, the parish will provide for their families at their decease: and, trusting to the poor's funds, when often they have no occasion to do so, they squander away their little pittance at the ale house, and dissipate all they earn as fast as they receive it."

By some such regulations as those stated above, he thinks, "this great obstacle towards erecting cottages might be totally removed; and besides, the real necessitous objects of charity, if their funds were properly managed, would be more amply and comfortably provided for, and the poor's rates, at the same time, might be greatly diminished; and that heavy and intolerable burden upon the farmer and the community would consequently be more easily sustained. It is further suggested, that "every cottager should have a small garden annexed to his cottage, sufficient to raise vegetables for the family use." It is conceived, that "about

twenty-five or thirty perches of ground, properly managed, would answer that purpose. Whatever more land the cottager may have occasion for, he should, it is contended, be dependant on the farmer for it."

The striking difference which is discoverable in cottagers which have such garden grounds attached to their cottages, and those which have none, in respect to their habits and conduct, has been well noticed by the Rev. Mr. Townsend, who says that the former are, in general, found sober, industrious, and healthy, while the latter are too frequently drunken, lazy, vicious, and diseased. And the reason, he conceives, to be that, "one fills up all his time with useful labour, whilst the other, for want of occupation, takes refuge in the ale-house, where he dissipates his scanty pittance, and destroys his health." And another striking difference to be noticed is, he says, "between those who have freehold tenements, and their neighbours who are obliged to rent: in the former we commonly observe, that openness and honesty which are seldom to be seen in men who are destitute of property. The peasant, whose ancestors built a cottage on the waste, with a sufficient garden, and the right of commonage for his cow, if he retain this little patrimony, brings up a numerous family without being reduced to the necessity of asking assistance from his parish. This man acquires habits of sobriety and industry, and his property is a pledge to the community for his good behaviour. These good qualities are transmitted to his offspring; and when his children go out to services, they, like their parents, are distinguished for ingenuous conduct: they resemble the sons of freemen, whilst the immediate descendants of those who have no freehold, too frequently have all the dispositions of a slave."

There can be little doubt but that great advantage may be derived by cottagers from portions of land being attached to their dwellings in the above points of view, as well as many others. The humanity, policy, and vast benefit of this system have been strikingly shewn in the thirty-seventh volume of the Annals of Agriculture by Mr. Robert Gourlay. The interests of agriculture indeed imperiously demand that every possible encouragement should be given to this necessary and important class of men. See COTTAGER-Farm.

COTTAM, in *Botany*, Rheed. See *MENTHA perilloides*.

COTTAN, in *Geography*, a town of Asia, in Little Bucharía; a place of considerable trade between the Tartars and the Indian merchants.

COTTE, ROBERT DE, in *Biography*, an eminent French architect, was born at Paris in 1656, and made director in the academy of architecture in 1699. In 1708 he was elected vice-protector of the academy of painting, and shortly after first architect to the king and superintendent of the buildings. The works which owe to Cotte all their elegance are very numerous at Paris, Versailles, &c. Among these were the grand altar of the cathedral at Paris; the fine Ionic colonade of Trianon, and the new building at the abbey of St. Denis: besides the many important works which he executed in France, he was employed by several German princes in the erection of palaces and country seats. He died at Passy in 1735. He was a man of great simplicity of manners, free from all ostentation, obliging and virtuous. His various works are distinguished for elegance, and an exact adherence to the rules laid down by the ancients, whom he surpassed in ornament, and in the happy distribution of his edifices. He introduced the fashion of mirrors over chimney pieces.

COTTER, in *Rural Economy*, a term often provincially employed, to signify a kind of iron key, to be passed through the eye of a bolt, when used as a fastening for any purpose.

COTTERAL, another term made use of in different districts, to signify the same sort of fastening.

COTTES, or **COTES**, in *Ancient Geography*, a promontory of Africa, not far from Timgis, and the straits of Hercules, mentioned by Mela, Ptolemy, and Strabo. It is also called Ampelusia by Mela. From Mela and Borchart it appears, that Cotes or Ampelusia were words of the same signification in the Phœnician and Greek languages, and that they were deduced from the grapes with which the promontory abounded. It is now called *Cape Sparte*. See **COTTA**.

COTTI, an ancient warlike people of Germany, who inhabited part of Hesse and Thuringia, from the Hartz mountains to the Rhine and Weser. Among them were comprehended the Mattiaci, whose capital was called from them Mattiacum, and by others Matticum, by some taken to be Marpurg, and by others Baden, on account of its hot waters.

COTTIÆ, a place of Cisalpine Gaul, between Laumelum and Carbantia, according to the itinerary of Antonine. It is now a village of the Milanese, called Cozzo.

COTTIAN ALPS. See **ALPS**.

COTTIARA, a town of India, on the sea-coast, E.S.E. of Elancon. Ptolemy represents it as the metropolis of the nation denominated Aii.

COTTILAB, in *Geography*, a town of Hindoostan, in the country of Mewat; 82 miles S. of Delhi, and 72 W. of Agra. N. lat. 27° 24'. E. long. 77° 7'.

COTTINGHAM, a village in the East Riding of Yorkshire, in the hundred of Harthill. In 1802, it was in contemplation to cut a canal from the Humber, at the port of Hull to this place. See **CANAL**.

COTTIS, in *Ancient Geography*, a town of India, on this side of the Ganges. Ptolemy.

COTTIUM, a place of Gallia Narbonensis, according to Strabo; situated towards Piedmont.

COTTIWAR, in *Geography*, a circar of Hindoostan in the country of Guzerat.

COTTOBARA, in *Ancient Geography*, a town of Asia, in Gedrosia. Also, a town of India on this side of the Ganges. Ptolemy.

COTTON, *Sir ROBERT*, in *Biography*, an eminent antiquary, born at Denton, Huntingdonshire, Jan. 22, 1570, was admitted in Trinity College, Cambridge, where he took the degree of Master in Arts: but it is not known at what place he laid the foundation of his knowledge either as a scholar or an antiquarian. From Cambridge he went to reside with his father, where he remained but a short time when he came to London, and was admitted a member of the Society of Antiquaries, which had been established in 1550. He now prosecuted his favourite study with great diligence and success, and began to collect ancient records, charters, and other MSS. which at his death proved to be the choicest collection of the kind ever seen in this or any nation. About the year 1600, he accompanied the celebrated Camden to Carlisle in order that they might examine more particularly the Picts wall. In the same year he wrote "A brief Abstract of the Question of Precedence between England and Spain," at the desire of Queen Elizabeth, who was sending her Ambassador to Boulogne to treat for peace with the archduke Albert. Early in the next reign

he was on account of his great learning and high merit created a knight, and during the whole of king James's life he was regarded and consulted as an oracle by the privy counsellors upon every difficult question relating to the constitution. In 1608, he was appointed one of the commissioners to examine into the state of the navy, which had been neglected since the demise of the late queen; he drew up a memorial, on this occasion, of their proceedings, to be presented to the king. He was employed about the same time on other subjects relating to the prince Henry; but chiefly upon "The Collections," he was ordered to make relating to the revenue of the crown; and the "manner and means how the kings of England have from time to time supported and repaired their estates." New means were devised to supply the wants of the monarch; with none, however, was he so much pleased, as with that of creating a new order of knights called baronets: Sir Robert, who had been of so much service in the affair, was chosen to be one, being the twenty-ninth that was created. He was soon after employed by the king to write animadversions upon Buchanan's and Thuanus's accounts of the behaviour and actions of Mary queen of Scots, and to give a different turn to them from what had been done by those two famous historians. In this and the next reign he was employed on various other topics, in most of which he sided with the views of the sovereigns by whom he was employed; but when the project of raising the value of the coin was submitted to him, he gave it the most serious and decided opposition, and shewed in a speech of great length before the privy council, what a dishonour such an alteration would be to his Majesty, and how great a loss it must prove to the subject. For this conduct it is probable that he was regarded with a suspicious eye by an arbitrary court, and in the end was imprisoned and ill-treated, because he had shown a zealous adherence to some of the principles of the constitution. In 1629 he was ordered to attend the privy-council, and his library was seized. This ill treatment, which no man appears to have less deserved, preyed so much upon his spirits that he never recovered; on his dying bed he imputed the shortening of his life to the loss of his liberty, and his library; the former indeed was restored to him, but it does not appear that he ever obtained the free use of the latter: such was the reward which the ill fated Charles reserved for a tried servant and faithful friend. He died at his house in Westminster, May 6, 1631, soon after he had completed his sixtieth year. Besides what he published during his life, he left a number of treatises in MS. which were printed in a collection of pieces written by eminent antiquaries. During his best days, this great and worthy man was the generous patron of all the lovers of antiquities, and his house and library were open to ingenious and inquisitive persons. To him indeed men of learning have been highly indebted ever since his time, by the valuable library which has long made one of the noblest collections in the British Museum. This library consists wholly of MSS.; many of which being in loose skins, small tracts, or very thin volumes, when they were purchased, Sir Robert caused several of them to be bound up in one cover. They related chiefly to the history and antiquities of Great Britain and Ireland, though the ingenious collector refused nothing that was curious or valuable on any point of learning. Biog. Brit.

COTTON, **CHARLES**, known as a burlesque poet, was born in 1630. He was educated at Cambridge, after which he travelled into foreign countries. During the life of his father, though married, he lived with him; and at his death succeeded to an estate, which, on account of the liberality

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of his disposition, was never equal to his wants. He entered the army, but before that, he had been known as a translator, though probably without much gain as an author. His most celebrated work was "Scarronides, or Virgil Travestie," and this appeared in 1678. It was extremely popular, and passed through fifteen editions. Of his translations, the most valuable was one of Montaigne's essays. He was married a second time, and by his wife, the countess-dowager Ardglas, he came in for a fortune of 1500*l.* *per annum*, which, nevertheless, was unable to rescue him from indigent circumstances. Besides the burlesque on Virgil, he attempted the same with regard to Lucian's dialogues which was popular, the eighth edition having been published in 1771. These dialogues, says a biographer, may be ranked with his "Virgil Travestie; they have the same humour, and the same licentiousness." He is supposed to have died in 1687; and about two years after a collection of his poems was published. He was of a sociable, open, and generous temper, but imprudent and licentious. He was the friend and associate of Isaac Walton, the well known angler, and to his treatise on "Angling," Cotton added a supplementary piece, containing, "Instructions how to angle for a Trout or Grayling in a clear Stream." *Biog. Brit.*

COTTON, or COTON, PETER, a French Jesuit, born in 1654, at Neronde, near the Loire, after passing through the usual introductory studies, removed to Milan, and thence to Rome, where he went through a theological course. On his return to France he became a very popular preacher, distinguished by his zeal and success in bringing over converts to the Catholic faith: among these was M. Lefdi-gueres, who was afterwards comptroller of France, and through whom he was recommended to Henry IV. who made him his confessor. In this situation he might have been raised to the dignity of cardinal, but he preferred the honourable office of a preacher, with a view of reclaiming his fellow creatures from what he conceived the error of their ways. The monarch was reproached for paying too great a deference to Cotton, and a pun upon his name was the common joke of the times, "Our prince is good but has Cotton in his ears." Henry himself asked the Jesuit, whether he would reveal the confession of a person determined to assassinate him, to which he replied, "No; but I would place my body between you and him." It is not certain but a confidence in such professions might be the means of putting that excellent monarch too much off his guard, who at length fell a victim to a vile assassin. After the murder of that unhappy prince, Cotton became confessor to the young king, Lewis XIII., in which office he continued seven years, when he retired from court to Lyons. In 1626, he was appointed provincial in the Isle of France; but was shortly afterwards summoned to appear before the parliament of Paris, who were justly alarmed by a publication issued from the pen of a brother Jesuit, in which the power of the popes was exalted above that of kings. His answers on this occasion were such, that the parliament felt themselves bound to issue an edict against the whole society. This was not what Cotton had expected: he trusted that his own reputation would have sanctioned all the principles avowed or concealed by the order. When he found himself disappointed, and the motives of the whole society scrutinized and exposed, he was so much hurt that he fell ill and died in a few days, in his sixty-third year. He wrote several pieces of a general nature: others on controversial subjects, a volume of sermons, and a letter to shew the conformity of the doctrine maintained by the Jesuits with the doctrine of the council of Trent. *Moreri.*

COTTON, in *Commerce*, the soft and beautiful vegetable down which forms the covering or envelope of the seeds of the gossypium or cotton plant. It is the spontaneous production of three parts of the earth, and is found growing naturally in all the tropical regions of Asia, Africa, and America, whence it has been transplanted and become an object of cultivation in the southern parts of Europe.

It is brought to us from the West India islands, the Spanish, Dutch, and Portuguese settlements on the coast of South America, and the isles of Bourbon and Mauritius in the East Indies. Georgia, and the southern states of North America, also annually produce great and increasing quantities. The islands and shores of the Mediterranean have long supplied Europe, and within these few years, the privileged merchants of India have brought hither considerable quantities from Surat, Madras, and Bengal.

The cotton from these different quarters of the globe varies considerably in the colour, length, fineness, and strength of its fibre. It is the produce of several species and varieties of the gossypium, and without wholly adopting the hypothesis of Quatremere Disjouvai, we may admit, that difference of climate has considerable influence on the texture and quality of the cotton.

According to the observations of that gentleman, crowned by the Academy of Sciences of Paris, the produce of the countries immediately under, or nearest the equator, is to be considered as the type of excellence, and is distinguished by its fine silky fibre, the depth and peculiarity of its colour, and the height and permanency of the plant. In proportion as we recede from the equator, says our author, these strong marked characters disappear, the fibre becomes coarse, its colour perfect white, and on the shores of the Mediterranean, we behold the lofty and flourishing tree of Hindoostan, dwindled down into a stunted annual shrub.

The exceptions to this system, from a comparison of the cotton of South America and the West Indies, with that of India and the Levant, are repelled by M. Quatremere Disjouvai with some ingenuity, but his observations and reasonings are too general; and we shall presently see that this system of gradation in size, colour, and fineness, from the equator to the poles, has no existence in nature, and is disproved by the characters we shall adduce of the principal varieties of cotton at present known in commerce.

It is true, that the finest cotton we have any knowledge of, is the produce of the tropical countries, as well as the deepest coloured. The delicate and unrivalled fabrics of the East, and the genuine nankeens of India and China, afford a proof of this. Yet the cotton from which they are produced, is retained at home to supply the native manufactures of the country, and is wholly unknown in commerce. The cotton of Bengal, Madras, and Surat, such as is brought in quantities to Europe, is scarcely tinged with yellow; and Siam, famous for its nankeen, is equally so for its fine white cotton, which has long been transplanted to the West Indies. The sea-coast of Georgia, and its dependant isles, though situated in latitude 33° north, ten degrees beyond the tropic, produces cotton superior in quality to the colonies of Guiana directly under the equator, whilst the inland districts of that province, and the country south of it, down to the mouth of the Mississippi, produce a cotton of greater whiteness, and far inferior in strength and fineness.

Cotton is distinguished in commerce by its colour, the length of its fibre, and its strength and fineness.

White is in general considered as characteristic of secondary quality.

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quality. The cotton of Smyrna, Cyprus, Salonica, and all parts of the Levant, is distinguished by its want of colour. The chief part of that from North America is also white, viz. New Orleans, Tennessee, and Upland Georgia.

Yellow, when not the effect of accidental wetting, or inclement season, is indicative of greater fineness. The cotton of the West Indies and of South America is called yellow, but the colour inclines more or less to cream colour. That from India has a slight tinge of Aurora. The fine Sea Island Georgia, though not properly a yellow cotton, has a faint but decided tinge, which distinguishes it from the white cotton of the same country.

In the following list are enumerated the chief, and nearly all the varieties of cotton used in this kingdom, with short notices of their quality and value.

North American Cotton.

Sea Island Georgia—is the produce of the coast of Georgia, and the small islands contiguous and belonging to it. It has a long and fine staple, but more or less silky, stained or dirty, on which account no other cotton varies so much in price. The best is preferred now to every other kind, and is often sold at very high prices to the manufacturers of lace.

Upland, or Bowed Georgia—is the produce of the inland districts, and either from the nature of the soil, or defective cultivation, is much inferior to the preceding. It is a light flimsy cotton, of weak, and very unequal staple, having long and short fibres intermixed. It is used chiefly for inferior goods. It derives its name of Bowed Georgia from an instrument like a bow, which the planters use in cleaning it.

Tennessee—much like Bowed Georgia, but in general cleaner, and sometimes better staple.

New Orleans—this also resembles Bowed Georgia, but it is generally preferred both to that and Tennessee. The fibre of these three kinds is weak, compared with that of West India, or Sea Island, and goods manufactured from it, are unable to endure the same hardship.

South American Cotton.

Pernambuca—fine, long staple; clean and pretty uniform in quality; much esteemed; principally used by the hosiery.

Maranham—rather inferior to Pernambuco; not so even in quality, nor so clean; much like good Demarara, and used for the same purposes.

Babia—much like Maranham; sometimes it has the advantage.

Rio—a very inferior cotton; very brown; much shell in it; used generally for the same purposes as low West India.

Surinam—has a long staple; clean; yellow; it is a fine cotton, and much used for making stockings.

Cayenne—a fine good clean staple, preferable to Surinam.

Demarara—the quality of this cotton has fallen off since the colony has been in possession of the English. The best has a fine silky strong staple, much esteemed. The inferior sorts are rather brown, dirty, coarse, and much mixed.

Berbice—the quality of this has of late years fallen off. The best has a good staple, fine, silky, and clean; but lately it is brown, dirty, and mixed.

Carthagena—has a very long staple, but weak; it is very stringy, and rather dirty.

Giron—a brown coloured cotton, fair staple, and generally pretty clean.

Cumena—inferior to Giron, and not so clean.

Carracas—inferior to Giron; still more dirty.

Laguira—inferior to Cumena, but preferable to Carraca; not so dirty.

West India Cotton.

Bahama—Cotton from the Bahama islands is of various qualities. The best is grown from Bourbon seed, but is much inferior to that kind. The staple is pretty good, fine and silky, but it is often dirty. The inferior Bahamas are very brown and dirty. The staple rather short but strong.

Barbadoes—is of fair middle quality, the staple not very long, but generally silky, and pretty strong; often a good deal of the shell of the seed in it, which is a great objection.

Jamaica—very little cotton grown here, and that of very inferior quality; there is the long staple, which is very weak, and often very dirty, and the short, which is also very poor and dirty.

St. Kitt's—very little grown; it is in general very brown, dirty, but of fair staple.

St. Lucia—the same.

St. Thomas—the same.

St. Domingo—sometimes very clean good cotton, and likewise very inferior; not much comes here.

Carriacou—rather a coarse grain, but in general clean, fair, strong staple, used by the hosiery to mix with fine cotton, such as Pernambuco.

Grenada—a good deal like Carriacou, but not always so clean.

St. Vincent's—rather high-coloured; clean, good staple, but not very fine; a good deal cultivated for the size of the island.

Antigua—very little grown, much like St. Kitt's.

Tortola, Montserrat, Dominica—the same.

Martinique—very little comes here. It is a fair middle quality.

Guadaloupe—much the same, sometimes very good cotton.

Tobago—little grown, sometimes very fair good cotton.

Trinidad—rather short staple, and in general very dirty.

East India Cotton.

Bourbon—the most even and uniform in quality of any other. It is a fine silky staple, and very clean. It is the most valuable cotton brought hither, except the best Sea Island.

Surat—has a fine, but exceedingly short fibre, in general dirty, containing leaf and sand. It is the lowest priced cotton in the market, and used in the manufacture of low coarse goods.

Bengal—much like Surat, but still shorter staple, in general cleaner, and much about the same value.

Madras—not much brought hither. It is mostly from Bourbon seed, and sometimes not unlike in staple, but in general dirty, and contains much shell, which renders it less valuable; worth little more than Surat; some very good will fetch the price of West India.

Turkey.

Smyrna, &c.—a short mossy kind, and rather dirty, used for making candlewicks; has more substance than Bowed Georgia.

The preceding observations are intended to give general ideas of the comparative value and qualities of the different kinds enumerated, rather than precise and accurate descriptions, which, from various causes, such as unfavourable

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seasons, exhausted soil, defective management and culture, cannot, as may readily be supposed, constantly and invariably apply.

In estimating their commercial value, we may place them in the following order, which compared with the gradation of M. Quatremere Disjonval's system, presents a curious contrast.

Sea Island Georgia, Bourbon—Pernambuca—Cayenne, Bahia, Maranham, Surinam—Demarara, Berbice—Bahama, Grenada, Carriacou, Barbadoes and best West India—Giron, and best Spanish, New Orleans, Smyrna—Jamaica, St. Kitt's, &c. &c., and inferior West India—Bowed Georgia, Carthagea, Carraccas, and inferior Spanish—Madras, Bengal, Surat.

The relative value of the cotton in the first half of this series, is tolerably permanent, and is here pretty accurately expressed. The varieties in the other half vary considerably. It is deduced from the average prices of the different kinds, during a period of several months.

It must be observed, however, that the low value of East India cotton from Surat, Bengal, and Madras, arises chiefly from the excessive shortness of its fibre, which, though fine and silky, unfits it for the manufacture of a fine thread by our mode of spinning, though we are assured the natives of Hindoostan employ it in the manufacture of their finest muslins.

The importation of cotton into Great Britain has progressively and rapidly increased during the last twenty-five years, as will appear from the following statements, from which some idea may be formed of the astonishing and unexampled increase and prosperity of our cotton manufactures during that period.

Importation of Cotton into Great Britain.

In the year	1781	5,101,920 lbs.
	1782	11,206,810
	1783	9,546,179
	1784	11,280,238
	1785	17,992,888
	1786	19,151,867
	1787	22,600,000
From 1786 to	1790	23,443,670 per an.
In the year	1799	46,000,000
	1800	56,010,732
	1802	65,850,395
	1806	75,000,000 *

* This year's importation is not given from official documents, and is not therefore to be relied on as strictly accurate.

London and Liverpool are the great marts for cotton, the chief part of which was for a long time imported into London, but the situation of Liverpool, in the very heart of the cotton manufactures of the north, has rendered it the principal market in the kingdom, and great part of the cotton belonging to the merchants of London is now consigned there.

The following is the number of bags, of about 300 lbs. each, imported into London and Liverpool in four different years, from which may be derived a tolerably accurate idea of the relative quantities of different kinds of cotton brought into this kingdom, and of the increased cultivation of some particular sorts.

Importation of Cotton into London.

	1798.	1799.	1805.	1806.
Hamburgh, Tonningen, &c.	7327	11208	514	137
Lisbon	5661	17818	3020	7281
Oporto	1095	2583	1373	1095
Gibraltar and Mediterranean	2748	752	1234	218
Charlestown and South Carolina	3079	3981	2113	3911
Philadelphia, Maryland, New York, &c.	2084	5172	469	1035
New Providence	1489	1911	1712	
Savannah	1221	1514		40
Smyrna	600	1208	54	1360
Guernsey	531		162	51
Jamaica	612	5003	366	639
Montferrat, St. Kitt's	729	838	1735	2325
Bahama	405			
Grenada	2122	846	1577	2632
St. Domingo	690			
Barbadoes	1911	686	1362	792
Antigua, St. Vincent's, and Tobago,	526	381		
Demarara	2581	3540	5294	4920
Martinique and Tortola	652	802		
Dominica	783			
Surinam	72	448	5040	3758
Copenhagen and Baltic		2020	601	
Berbice		192	2467	1458
	36918	60903	29093	31606

Importation of Cotton into Liverpool.

	1805.	1806.	1791.	1799.
America	100,148	100,142	64	13,236
Lisbon	36,739	33,646		
Oporto	1958	1647	34,500	25,362
Demarara	9495	10981		
Berbice	6715	5784		8102
Surinam	3072	1139		
Barbadoes	7995	5495		
Bahamas	1634	1980		
Dominica	775	1491		
St. Thomas	1170	1743		
Antigua	83	278		
Tortola	1221	1325		
St. Lucia	1288	1389		
St. Kitt's	260	224	25,777	28,394
St. Vincent's	183	189		
Nevis	29	72		
Grenada	200	384		
Trinidad	125	287		
Cuba	175			
Montferrat	24	10		
Jamaica	2483	4011		
Bourbon	588			
Spain	608			
Ireland	450	546	3871	1690
Tobago		5		
Teneriffe		306		
Holland			1950	
Turkey			2242	
	177,418	173,074	68,404	86,784

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From these statements it appears, that in 1791, sixty four bags of cotton only were brought into the port of Liverpool from North America; 25,814 into London and Liverpool in 1799, and in 1806, upwards of one hundred thousand bags, into Liverpool alone; nearly half the quantity imported into the whole kingdom of every description whatever.

The cultivation of cotton is become an object of principal concern, and is rapidly increasing in the southern states of North America. The produce of some parts of Georgia, as we have before observed, is of very superior quality; and there is every reason to believe, that in a few years, it will rival in quantity, as well as quality, the fine cottons of Brazil and Guiana.

It may not, perhaps, be irrelevant to our subject, to remark here, that the colonization of Georgia formed the subject of a memorial presented to the duke of Newcastle, then secretary of state in the reign of George I., by colonel John Parry, a native of Switzerland. In this memorial, which was afterwards published, he sets out with this postulate, that "there is a certain latitude on our globe, so happily tempered between the extremes of heat and cold, as to be more peculiarly adapted than any other for certain rich productions of the earth," amongst which he enumerates silk, cotton, indigo, &c.; and he fixes on the latitude of 33, whether north or south, as the identical one for that peculiar character. He settled some years afterwards, with a colony of his countrymen, on the river Savannah, which parts Carolina from Georgia, where he perpetuated his name by founding the town of Parrysburg; and proved, in some degree, the truth of his system, by the introduction of those objects of cultivation, which have since become staple articles of the country.

The first importation of cotton from the East Indies took place in the year 1798. This cotton is not imported by the India company, but by the privileged merchants; and the first cargo brought by the Fame, and valued at 10,000*l.*, cleared the enormous sum of 50,000*l.* The cotton at that time sold at 2*s.* 2*d.* per pound, the following year it fell to 10*d.*, and is now the lowest priced cotton in the market.

The following is the amount of importations since that time.

Importation of East India Cotton.	
1798	4637 Bales of about 350 lbs.
1799	19714
1800	19820
1801	12111
1802	8900
1803	10476
1804	3546
1805	1842
1806	8422

All cotton whatever is subject to a duty of 2*d.* per pound, and also of 1½ per cent. on that amount. Calculated at the prices of that article in 1803. The amount of the duty on each particular kind is as follows.

Sea Island Georgia	-	4 per cent. ad valorem
Fine Brazil	-	8
British West India	-	8½
Foreign West India	-	10
Inferior Brazil	-	12
Turkey	-	12
Bowed Georgia	-	12½
Spanish Cotton	-	15 to 23½

Cotton, as a vegetable substance, approaches in its nature nearly to the ligneous matter, or woody fibre, and affords, by destructive distillation, the same products, and nearly in the same proportions as the hard and heavy woods. It is distinguished by its great affinity for earths and metallic oxydes, but more especially for alumine and iron, on which is founded the theory and practice of calico-printing.

It is little alterable, insoluble in water, and the chief part of the weaker reagents. Nitric acid converts it into various vegetable acids. Vitriolic acid acts upon it as on ligneous fibre, both are decomposed, charcoal developed, and sulphureous acid given out. It is also distinguished by the beauty and permanency of the white which it acquires by alternate exposure to the action of alkalies and atmospheric air, or oxygenated muriatic acid.

The structure of the fibres of cotton has not been well ascertained. Lewenhoeck, by microscopical examination, found them to have two sharp sides, and it seems to be owing to this circumstance, and to their possessing some asperities like the filaments of wool, that cotton greatly irritates and inflames wounds and ulcers, if applied to them instead of lint.

COTTON, in *Ancient Geography*, a town of Asia Minor.

COTTON-grass, in *Botany*. See **ERIOPHORUM**.

COTTON Manufacture, in *Commerce*, one of the leading and most important branches of our national industry and commerce.

The history of its progress during the last century, affords a splendid instance of the successful application of industry and talent to a branch of manufacture, unparalleled in the annals of commerce.

Scarcely fifty years have elapsed since it was amongst the humblest of our domestic arts, and was confined chiefly to the fire side and cottage of the labouring poor of Lancashire. Its products were few, and mostly for home consumption, though some articles from Manchester were exported above a century ago. Its processes were simple, and the contrivances for accelerating labour, such as had been handed down for ages past with little alteration. The population engaged in this manufacture about the year 1750, is supposed not to have exceeded 20,000, and was little more than doubled in the succeeding twenty years.

From this state of comparative insignificance, it burst forth at once with a vigour and activity which has no parallel, and from causes which we shall state hereafter, became in the short period of thirty years, one of the most flourishing and important branches of our national industry.

For our internal consumption, it affords a variety of fabrics, suited not only to the ordinary wants and comforts, but also to the elegancies of life; and for exportation, such now is our superiority, that there is scarcely a civilized nation on the earth, that is not indebted to us for some article of this manufacture, and well authenticated accounts have been published of their having been found as articles of dress amongst the distant tribes of Tartars.

In the following article we shall endeavour to trace the progress of this manufacture from its origin down to the present time, and the causes which have contributed so powerfully to raise it in a few years to a state of importance, little short of that which the great staple manufacture of this country, that of wool, has acquired during the five last centuries.

The period of its first introduction into this country is not clearly ascertained, and there are few authentic documents of earlier date than the middle of the seventeenth century,

century, before which time, it is probable that the manufacture of cotton was too inconsiderable to deserve much notice.

The first historical notice we meet with is in the Itinerary of Leland, who visited Lancashire in the reign of Henry VIII. "Bolton-upon-Moore market," says he, "standeth most by *cottons*, divers villages in the moores about Bolton do make cottons." From this an inference has been drawn in favour of the existence of the manufacture of cotton in Lancashire at this early period, a supposition which is however completely overturned by an act passed the 5th and 6th of Edward VI. 1552; entitled "for the true making of *woollen* cloth," in which it is ordered "that all the cottons, called Manchester, Lancashire, and Cheshire cottons, full wrought to the sale, shall be in length twenty-two yards, and contain in breadth three quarters of a yard in the water, and shall weigh *thirty pounds* in the piece at least. Also that all other cloths called Manchester rugs, otherwise named Manchester frizes, full wrought for sale, shall contain in length 36 yards, and in breadth three quarters of a yard, coming out of the water, and shall not be stretched on the teater, or otherwise, above a nail of a yard in breadth, and being so fully wrought and well dried, shall weigh every piece 48 lbs. at the least." However paradoxical it may appear, it is nevertheless clear from this passage of the act, that the Manchester cottons of that day were a species of woollen cloth, and that of the coarsest and strongest kind, as is sufficiently proved by the weight required by the statute. The testimony of Camden also to this point is decisive: when speaking of Manchester in 1590, he says, "this town excels the towns immediately around it in handfomeness, populousness, *woollen manufactures*, market place, church and college, but did much more excel them in the last age, as well by the glory of its *woollen* cloths, which they call Manchester *cottons*, as by the privilege of sanctuary, which the authority of parliament under Henry VIII. transferred to Chester."

The manufacture of these cottons was known also in Wales, as appears from the 8th of Elizabeth, 1566; in which we have the following historical fact. "In the town of Shrewsbury there hath been, time out of mind of man, and yet is, a company, fraternity, or guild, of the art and mystery of drapers, which said fraternity hath by reason of a certain trade and occupation, of buying and selling of Welsh cloth and linen, commonly called *Welsh cottons*, frizes and plains, which they have had and used amongst them, been able not only to live thereby, but also have, at their common cost, provided houses and other necessaries for poor people within the said town of Shrewsbury." The distinction of the Welsh cottons here into frizes and plains, is another proof of their being made of wool.

It is certainly singular, that the term cotton should be applied to goods manufactured wholly of wool, and which from their weight and substance could not possibly be intended as imitations of, or substitutes for, the cotton goods of any other country.

The fact is however sufficiently evident from the preceding quotations, and still further from the consideration that at the present day the *Kendal cottons*, a manufacture which has subsisted now near five centuries, are made entirely of wool, and that of the coarsest kind.

Like the Welsh cottons they are manufactured both frized and plain; and are used chiefly for negro cloathing in America and the West Indies, though some are worn at home by the poor or labouring husbandmen. Various conjectures have been offered respecting the origin of the name, but the most probable is, that it is a corruption of the word

coating. However this may be, it is very certain that the Manchester, Cheshire, and Welsh cottons, which in all probability were derived from those of Kendal, were made entirely of wool, and that it is to these goods the observation of Leland applies in the quotation we have before given.

To whatever purpose cotton was applied, it is certain that long before we have any mention of the manufacture the raw material was imported into this kingdom. The earliest record we have met with, in a hasty and not very extensive search, is preserved by the accurate and indefatigable Hackluyt in the first volume of his Collection of Voyages, and is contained in a little work entitled the "Process of English Policy." The intent of the whole poem (for such it is) is to inculcate the absolute necessity to our commerce and existence as a free state, of England keeping the dominion of the seas; but it is chiefly valuable for the list which it contains of the different natural productions, as well as manufactures, which were at that time the objects of commercial intercourse between the European states. After enumerating the various articles which constitute the trade of Spain, Flanders, Portugal, Britain, Scotland, Ireland, Prussia, Germany, Venice, Florence, Brabant, Holland, &c., he tells us, that "Genoa resorts to England in her huge ships, named Carracks, bringing many commodities, as cloth of gold, silk, paper, much woad, wool, oil, cotton, roach alum, and gold coin; and they bring back from us wool and woollen cloth made with our own wool." It is evident from the preceding quotation, that at least as early as 1430, about which time this little work was first printed, and probably also much earlier, this country was supplied by the Genoese with cotton from the Levant. The Genoese possessed this trade till the year 1511, when, according to Hackluyt, from that time to 1534, "divers tall ships of London and Bristol had an unusual trade to Sicily, Candia, and Chios, and sometimes to Cyprus and to Tripoli, and Baruth in Syria. They exported thither sundry sorts of woollen cloths, calf-skins, &c., and imported from thence silks, camblets, rhubarb, malinsief, muscadell, and other wines, oils, cotton-wool, Turkey carpets, galls, and India spices. The Levant trade was soon after engrossed by the merchants of Antwerp, and till 1575 entirely abandoned by the English. Wheeler, who wrote in 1601, says, that "a little before the troubles in the Low Countries, the Antwerpians were become the greatest dealers to Italy, in English and other foreign merchandize, and also to Alexandria, Cyprus, and Tripoli in Syria, beating the Italians, English, and Germans entirely out of the trade, as they also soon did the Germans at the fairs and marts of their own country." Accordingly we find from the same author, that cotton was one of the many articles with which they supplied this country at that period, which they brought chiefly from Sicily and the Levant, and sometimes from Lisbon, along with many other precious articles which the Portuguese derived at that time from India. After the sacking of Antwerp the English trade to the Levant revived, and in 1621 was in a flourishing state, as appears from the testimony of Mr. Munn, in his treatise on the trade of India, in which cotton is enumerated as one of the many articles brought by our merchants from the Mediterranean.

From these quotations it is evident, that previous to the discovery of America and the West Indies, and for some time afterwards, this country, and probably all Europe, was supplied with cotton from the Levant.

How far, from this early importation of the raw material, we have a right to infer the existence of a cotton manufacture in this kingdom, may perhaps admit of some dispute.

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yet it is certainly very probable that, acquainted as we must have been in some degree with the cotton cloths of the East, and other countries, and furnished with the material for their fabrication, some attempts would be made to imitate them. Our great use of cotton no doubt, at these early periods, was for candlewicks; and to whatever purpose else it was applied, the manufacture had made no great progress in this country till the beginning of the seventeenth century, nor does it appear that on the continent, from whence, till within these few years, almost all our manufactures of cloth have been derived, the manufacture of cotton had made any progress before the middle of the sixteenth century.

Fustians were first made in Flanders, if we may credit Guicciardini, in his history of the Netherlands, who however assigns no date to their first introduction. In the little work we have before alluded to, anno 1430, preserved in "Hackluyt's Collection of Voyages," they are mentioned not only as an article of export from Flanders to Spain, but of import also from the Easterlings, Prussia, and Germany. We are disposed to believe they were first manufactured in Italy, where, from its proximity to the countries affording cotton, as well as its earlier communication with those nations which supplied Europe with cotton cloths, it was more likely to originate, than in the more remote and northern states of the continent: and we learn also from Guicciardini, in another part of his work, that in 1560, Antwerp annually imported from Milan "great quantities of gold and silver thread, various wrought silks, gold luffs, fustians and dimities of many fine sorts, scarlets, tammies, and other fine and curious draperies."

That the manufacture of fustian came originally to this country from the Netherlands is highly probable, and it is said to have been established in the towns of Bolton and Manchester by Protestant refugees. Fustians were manufactured there in the beginning of the seventeenth century, and it is probable their first introduction was not much earlier. Had the Flemish carried this manufacture to any great extent, it would have found its way to this country much earlier, from the vast number of weavers and manufacturers of every description that emigrated to England, from the time of Edw. III. down to the troubles in the Low Countries during the reign of Philip II. of Spain.

In one of the sumptuary laws of James I., passed in the parliament of Scotland in 1621, it is enacted, "that servants shall have no silk on their cloaths, except buttons and garters, and shall wear only cloth, fustians, and canvas of Scotch manufacture." This prohibition would seem to imply a very advanced state of the manufacture of these articles in Scotland.

The first authentic document concerning the cotton manufacture of this kingdom, is contained in Lewis Roberts' "Treatise of Traffick," published in the year 1641, and is as follows. "The town of Manchester buys the linen yarn of the Irish in great quantity, and weaving it, returns the same again in linen into Ireland to sell. Neither does her industry rest here, for they buy cotton wool in London that comes from Cyprus and Smyrna, and work the same into fustians, vermilions, and dimities, which they return to London, where they are sold, and from thence, not seldom, are sent into such foreign parts where the first materials may be more easily had for that manufacture."

The manufacture of linen cloth, properly so called, never we believe, constituted any great part of the trade of Manchester, but the fustians, and indeed all the cotton goods of that period, were made of linen warp, composed of Hamburg or Irish yarn, but chiefly of the latter, and these

probably formed great part of the linen goods which Mr. Roberts says were returned to Ireland.

Soon after this period, fustians were manufactured in quantities at Bolton, Leigh, and the places adjacent: but Bolton was the principal market for them where they were bought in the grey by the Manchester dealers, who finished and sold them in the country. The Manchester traders went regularly on market days to buy fustians of the weavers, each weaver then procuring his own yarn and cotton as he could, which subjected the trade to great inconvenience. To remedy this, the chapmen themselves furnished warps and cotton to the weavers, and employed persons in all the little villages and places adjacent, to deliver out materials, and receive back the manufactured goods when finished. Each weaver's cottage formed at that time a separate and independent little factory, in which the raw material was prepared, carded, and spun, by the female part of the family, and supplied wool, or wett, for the goods which were wove by the father and his sons.

The kinds of fustian then made were herring-bones, pillows for pockets and outside wear, strong cotton ribs and barragon, broad-raced linen thicksets and tufts, with whitened diaper, striped dimities and jeans. These were succeeded by cotton thicksets, goods figured in the loom, draw boys, and at later periods by cotton velvets, quiltings, counterpanes, corded dimities, velvets, velvetteens, and strong and fancy cords. It is scarcely possible to convey any adequate idea of the varieties of cotton goods that have issued from the loom, since the first dawn of this manufacture to the present time. The pattern cards of Manchester goods sent out to the continent by the leading houses engaged in the foreign trade, have presented specimens of near two thousand different kinds, varying in strength and fineness, from the coarse and heavy fabrics to the finest and most delicate muslins, and in colour from the richest chintz to plain and self-coloured grounds: some figured in the loom, some checked and others plain, yet all, or the greatest part of them, composed entirely of cotton.

For the introduction or improvement of many of these branches, this country is indebted to the late Mr. Wilson of Ainsworth, near Manchester, originally a manufacturer of fustian. He early engaged in the manufacture of cotton velvets, which, by unremitting efforts, he brought to the utmost degree of perfection, and considerably improved the mode of dressing, finishing, and more particularly of dyeing, which at that time was very imperfect. His goods, especially his velvets, were finished in a style that acquired a high character, both at home, and in the foreign market, and were readily distinguished from those of any other manufacturer. He cleared off the loose and uneven fibres with razors, and burnt or singed them with spirits of wine. This mode was succeeded by the use of hot irons, in form somewhat resembling the weavers' drying iron, but rounder, which were first employed by Mr. Witlow: and at a later period by cylinders of cast iron heated to redness, over which the goods were evenly and rapidly drawn, and thus freed from that superfluous down, or pile, which they had acquired in the loom, or in the various operations of washing, bleaching, or dyeing.

Towards the middle of the last century, or soon afterwards, the manufactures above enumerated, or such of them as were then known, had become of great importance to the towns of Manchester and Bolton, affording various articles for home consumption, as well as for an increasing foreign trade, and giving employment to great part of the population of the surrounding country. They had arrived at that state at which a pause must naturally have ensued, and beyond

beyond which they must have advanced with the flow and gradual increase of population; which, aided by every advantage, as well as by emigration from other districts, could never have kept pace with the demand, without the introduction of those improvements to which this country owes the prosperous and unrivalled state of its cotton manufactures, and of which we shall now proceed to give some account.

The mode of spinning in use in this country at that period was by the hand; on the well known domestic machine called a *one-thread wheel*. A single spindle put in motion by a wheel and band turned by the right hand, whilst the thread was managed by the left, composed the whole of this simple apparatus, on which one person could with difficulty produce a pound of thread, by close and diligent application, the whole day. The goods then manufactured were strong and coarse, compared with those of the present day, and little or no thread finer than from 16 to 20 hanks in the pound, each hank measuring 840 yards, was then spun. It was subject, as may readily be conceived, to great inequalities, its evenness depending greatly on the delicacy of touch, which the spinner by long habit had acquired, and varied with every little difference in the extension of the thread during twisting, and the revolution of the spindle in portions of the same length. As the demand for cotton goods increased, various contrivances were thought of for expediting this part of the manufacture. A patent was obtained by a person named Paul, and some others of London, for an engine for a more easy and expeditious mode of spinning cotton, and several other attempts were made at subsequent periods, but all with equal want of success, till the invention of the *Jenny*, by James Hargreaves, in the year 1767. Hargreaves was a weaver at Stanhill, near Church, a few miles distant from Blackburn, in Lancashire. He was a plain, industrious, but illiterate man, and possessed little mechanical skill or talent. He resided near the print ground, the first and infant establishment of the late Robert Peel, esq. from whose hints and conversation he derived much important assistance, and whose strong and active mind was at that time engaged in the promotion of every useful improvement connected with that branch of manufacture, in which he was afterwards so extensively concerned. An anecdote is still recorded in the neighbourhood, which ascribes to accident the parent of so many useful discoveries, the first invention of the *Jenny*. A number of young people were one day assembled at play in Hargreaves' house, during the hour generally allotted to dinner, and the wheel at which he or some of his family were spinning, was by accident overturned. The thread still remained in the hand of the spinner, and as the arms and periphery of the wheel were prevented by the framing from any contact with the floor, the velocity it had acquired still gave motion to the spindle, which continued to revolve as before. Hargreaves surveyed this with mingled curiosity and attention. He expressed his surprize in exclamations which are still remembered, and continued again and again to turn round the wheel as it lay on the floor, with an interest which was at that time mistaken for mere indolence. He had before attempted to spin with two or three spindles affixed to the ordinary wheel, holding the several threads between the fingers of his left hand, but the horizontal position of the spindles rendered this attempt ineffectual; it is not therefore improbable, that he derived from the circumstance above-mentioned the first idea of that machine which paved the way for subsequent improvement. It consisted at first of only 8 spindles, turned by bands from an horizontal wheel, in the centre of which was fixed a vertical shaft, with a handle at the top for the spinner. The threads passed between two horizontal pieces

of wood, the breadth of the machine, which, when pressed together, clasped fast the roving like the finger and thumb of the spinner, and were thus extended or drawn out. He had great difficulty in putting up the thread, or winding it on the spindle after twisting, which he at last accomplished by means of a treadle connected with a wire, and worked by the foot of the spinner. The *Jenny* in its original form was a rude machine. The first was made almost wholly with a pocket knife; and the clasp, by which the thread was drawn out, was the stalk of a briar split in two. It was, as may readily be conceived, defective in the construction of those parts essential to the performance of its work, and which an ordinary mechanic would have had no difficulty in contriving; but Hargreaves was obliged to work in secret, and possessing little mechanical skill, to avail himself of such assistance as he could procure, without making public the object he had in view.

Popular prejudice was soon excited against him, and the threats of his neighbours obliged him to conceal his machine for some time after it supplied the woof or weft for his own looms. It was, however, generally known that he had made a spinning machine, and his wife, or some of his family, having imprudently boasted of having spun a pound of cotton during a short absence from the sick bed of a neighbouring friend, the minds of the ignorant and misguided multitude became alarmed, and they shortly after broke into his house, destroyed his machine, and also part of his furniture. Hargreaves soon after removed to Nottingham, whither he was invited by the stocking weavers of that place, and where he assisted in the erection and management of a mill, about the time that Mr. Arkwright first settled there, after being in the same manner driven out, or rather deterred from settling in Lancashire, by the clamour and prejudice of the people. Hargreaves was little qualified, either by education or address, for the sphere of life into which he was removed, and after having assisted various persons in the construction of machinery, and communicated to each by turns the whole of what he knew, he died in poverty, ill requited by his employers, and little known to the country, which has since reaped such important benefits from his discovery. Before he quitted Lancashire, he had made one or two wheels of 12 or 16 spindles each for some of his relations or friends, and as the popular clamour abated, the number of these increased, till a second mob scoured the whole country and destroyed every machine, they could meet with. The value of this improvement however was so strongly felt, and the measures adopted against the ringleaders of this outrage so vigorous and decisive, that new wheels were immediately constructed, and it was remarked that many of those concerned in opposing their first introduction, were amongst the foremost to avail themselves of the advantages they now promised. Various alterations were made in the original machine, which from its form was inconvenient and tiresome to grown up persons, though girls of twelve or fourteen managed it with ease. The vertical wheel was substituted for the horizontal one, which rendered it much easier to work, and the treadle, which required an awkward and constrained posture, was rendered unnecessary by a simple contrivance managed by the hand. They were enlarged in their dimensions from twelve to twenty, and afterwards to thirty, fifty, and even eighty spindles; and their use rapidly extended over all the country, though their first introduction every where met with the most determined opposition. Even at Nottingham, if our information be correct, a serious affray took place on the first erection of the new machines, in which Hargreaves himself was severely wounded, and a young woman, who had accompanied him from Lancashire,

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cashire, and had been accustomed to the management of his first Jenny, nearly lost her life.

To Hargreaves also is ascribed an improvement in the mode of carding, which, before his time, had been performed with hand cards, on the knee, a tedious and laborious operation. These were succeeded by stock cards, in which the lower card was fixed immovably on a stool or stock, which left both hands at liberty to manage the upper one. These were first used in the woollen manufacture, and introduced into Hargreaves' neighbourhood from Rofendale. His improvement consisted in applying two or three cards to the same stock, and suspending the upper cards, which from their weight and size would otherwise have been unmanageable, from the ceiling of the room by a cord passed over a pulley, to the other end of which was affixed a weight or counterpoise. With these, one woman could perform twice as much work, and with greater ease than she could do before in the common way.

The stock cards were succeeded soon after by cylinder cards, the invention of which is claimed by so many different persons, that it is impossible now to determine to whom the merit is due. Amongst the first who employed them, was the late Mr. Peel, who constructed a carding engine with cylinders at Blackburn, as early as the year 1762, in which he was assisted by Hargreaves.

Mr. Peel's engine consisted of two or three cylinders, covered with cards, but had no contrivance for stripping, or taking off the carded cotton. This was performed by two women with hand cards, who alternately applied them to the last, or finishing cylinder, and thus took off the carding by turns. This was, in all probability, the first carding machine that was made; but Mr. Peel's other avocations not permitting him to pursue the subject at that time, it was laid aside, and some years elapsed before it was improved and perfected by other hands.

Notwithstanding the severe punishment of the ringleaders of the last outrage, and the friendly means adopted to convince the labouring class of the folly and injustice of opposing these improvements, by which not only the country, but themselves, would in the end be so materially benefitted, considerable alarm and uneasiness were again excited, and though no scarcity of work had been experienced, a belief universally prevailed, that all manual labour would soon be annihilated by the use of these new machines. A third and more numerous mob therefore assembled in the year 1779, by which all the machinery turned by water or horses, both for carding and spinning, and all the Jennies above a certain size, that could be found within eight or ten miles of Blackburn, were completely destroyed. Jennies of twenty spindles, or under, were alone respected, every machine turned by water was demolished, and the large Jennies were either cut into two small ones that came within the size prescribed, or if the owner chose, into one of twenty spindles, by sawing off the extra number which was often consigned to the flames. These and similar disturbances in different parts of the country impeded for an instant, but could not arrest the progress of this manufacture. Mr. Peel, whose machinery at Altham was totally destroyed and thrown into the river, and whose personal safety was oftentimes in danger from the fury of a licentious and ungovernable mob, retired in disgust from the country, and established a cotton mill at Burton in Staffordshire, on the banks of the Trent, where he continued to reside many years afterwards.

Soon after the invention of the Jenny in 1767, sir Richard, at that time Mr. Arkwright, brought forward his improvement in spinning, on which he had been long

and laboriously engaged. This distinguished character, whose perseverance and invention raised him from one of the most humble occupations in society to affluence and honour, was the youngest of thirteen children, and was born in the year 1732, at Preston, in Lancashire. In this neighbourhood was then carried on a considerable manufacture of linen goods, and linen and cotton mixed, the various operations of which he had an opportunity of becoming intimately acquainted with, and being a man of uncommon natural powers, he directed his thoughts to the improvement of the mode of spinning, which had probably been conducted for ages by the same process. The first hint for effecting this improvement, he accidentally received from seeing a red-hot iron bar elongated, by being passed through iron rollers. Between this operation and that of elongating a thread, as now practised in spinning, there is no mechanical analogy; yet this hint being pursued, has produced an invention, which, in its consequences, has been a source of national and individual wealth unparalleled in the annals of the world.

The difficulties which Mr. Arkwright experienced before he could bring his machine into use, even after its construction was sufficiently perfect to demonstrate its value, would perhaps for ever have retarded its completion, if his genius and application had been less ardent.

His circumstances were by far too unfavourable to enable him to commence business on his own account, and few were willing to risk the loss of capital on a new establishment.

Having at length, however, had the good fortune to secure the co-operation of some persons who saw the merit of the invention, and were willing to assist his endeavours, he obtained his first patent for spinning by means of rollers in the year 1769, and to avoid the inconvenience of establishing a manufacture of this kind in the heart of the cotton manufacture, such as it then existed, he removed to Nottingham. Here, in conjunction with his partners, he erected his first mill, which was worked by horses, but this mode of procedure was found to be too expensive, and another mill on a larger scale was erected at Cromford in Derbyshire in the year 1771, the machinery of which was put in motion by water.

This patent right was contested about the year 1772, on the ground that he was not the original inventor. He obtained a verdict however, and enjoyed the patent without further interruption to the end of the term for which it was granted.

As the essential part of Mr. Arkwright's machine was entirely new, and was applied with the happiest success in various other forms for preparing the raw material for spinning, of which we shall speak hereafter, we shall pause a while in the historical detail of these inventions, and explain the general principles of its construction, and the mode in which its operation was performed. Previous to the year 1767, as we have already observed, all the spinning was performed on the domestic one-thread wheel, of which there were two kinds. The first, which we have before described, required the raw material to be previously prepared and carded, and was used for wool and cotton. The cardings were soft and loose rolls of the thickness of a candle, and from eight to twelve inches long, possessing little strength or tenacity, the slightest force being sufficient to break or pull them asunder. One end of this roll being held between the finger and thumb of the spinner, and the other twisted round the point of the spindle, was rapidly drawn out during its revolution, and formed a coarse soft thread called a *roving*. For coarse woollen goods, this operation was sufficient,

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cient, and the thread was ready for the loom, but for fine cloth, and more especially for cotton, this operation of *twisting* and *drawing* was repeated, and the roving was converted into a smaller, firmer, and longer thread. To this last operation, the term *spinning* was more particularly applied, the first being considered as preparatory, and was generally denominated *roving*. For some time after the introduction of the Jenney, this mode of roving on the single spindle continued in use, the joining of the short rolls or cardings, rendering manual dexterity absolutely necessary.

The second mode of spinning was on the flax wheel, and used for those substances, whose fibres from their nature, but more particularly from their length, would not admit of the preparatory process of carding. Their fibres were dressed and disposed in an even and parallel direction, by an operation resembling *combing*, and were then coiled round the head of the distaff, affixed to a wheel furnished with a spindle, bobbin, and fly. The fly and spindle moved together, and were kept in rapid motion by a wheel and band, worked by the foot of the spinner. The bobbin which received the thread, ran loose upon the spindle, and moved only by the friction of its ends, in proportion as the fibres of the flax were disengaged from the distaff, by the finger and thumb of the spinner, and were twisted by the fly. If we suppose the machine itself to be left at liberty, and turned without the assistance of the spinner, the twisted thread being drawn inwards by the bobbin, would naturally gather more of the material, and form an irregular thread, thicker and thicker, till at length the difficulty of drawing out so large a portion of the material as had acquired the twist, would become greater than that of snapping the thread, which would accordingly break. It is the business of the spinner to prevent this, by holding the material between the finger and thumb, and by separating the hand during the act of pinching, that the intermediate part may be drawn out to the requisite degree of fineness previous to the twist.

To accomplish these ends by machinery, the object of Mr. Arkwright's invention, two conditions became indispensably necessary. 1st. That the raw material should be so prepared as to require none of that intellectual skill, which is capable of separating the knotty or entangled parts as they offer themselves. And 2dly. That it should be regularly *drawn out* by certain parts resembling the finger and thumb of the spinner. The first of these was completely fulfilled by the various machines and contrivances for the preparation of cotton for spinning, which sir Richard afterwards invented and obtained a patent for; the second was accomplished in his first and capital machine, since called the Twist, or Water Frame.

The contrivance for *drawing out* the thread constituted the great merit of the invention, the fly, bobbin, and spindle connected with it, being derived with little alteration from the flax wheel before described. It consisted of a pair of cylinders, slowly revolving in contact with each other, at a little distance from a second pair revolving with greater velocity, the lower cylinder of each set being furrowed, or fluted, in the direction of its length, and the upper ones neatly covered with leather to enable them to hold the thread. If we suppose the end of a roving, or loosely twisted thread, to be passed through the first pair only, it may readily be imagined that it will be gradually drawn off the bobbin, and pass through the cylinders without suffering any other sensible change in its form or texture, than a slight compression from the weight of the incumbent cylinder. But if from the first pair it be suffered to pass immediately to the second, whose surfaces revolve much quicker, it is

evident that the quicker revolution of the second pair, will *draw out* the cotton, rendering it thinner and longer, when it comes to be delivered at the other side. This is precisely the operation which the spinner performs with his finger and thumb, and the application of this simple and beautiful contrivance to the spindle and fly of the common flax wheel produced that machine for which Mr. Arkwright's first patent was obtained, and which laid the foundation of all his subsequent discoveries.

Soon after the erection of his mill at Cromford, Mr. Arkwright made many improvements in the mode of preparing the cotton for spinning, and invented a variety of ingenious machines for effecting this purpose in the most correct and expeditious manner; for all of which he obtained a patent in the year 1775.

The validity of this second patent was tried in the court of King's Bench, in the year 1781, and a verdict was given against him on the ground of the insufficiency of the specification, but on the 17th of February 1785, in the court of Common Pleas, before lord Loughborough, the question was again tried, and he obtained a verdict, having established by evidence the sufficiency of the specification.

This verdict, in consequence of great numbers having engaged in the erection of machines during the interval of four years that had elapsed since the former decision, occasioned considerable alarm, and raised up a host of enemies, from whom a premium on each spindle was demanded, under the threat of immediate suit. An association was formed of the manufacturers principally concerned in the business, and another cause instituted by writ of *scire facias*, was tried before judge Buller in the court of King's Bench, on the 15th of June 1785, in which, after a very long trial, he was cast on the ground of his not being the original inventor.

Conscious that this was not the case, he moved in the court of King's Bench, on the 10th of November 1785, for a new trial; stating that, not being aware of the nature of the evidence to be brought forward on this trial for the first time after so many years had elapsed, he was then unprepared, but was now able to substantiate by proofs the falsity of great part of the evidence which went to that point. The rule however was refused, and on the 14th November 1785, the court of King's Bench gave judgment to cancel the letters patent.

The inventions claimed by Mr. Arkwright, which gave rise to these reiterated contentions with the rival manufacturers of Lancashire, related chiefly to the operation of carding, which was now brought to great perfection. Before we enter however into any account of these improvements, it will be necessary to take a short view of the nature of this operation, and the mode in which it was performed at the date of Mr. Arkwright's second patent.

The *card* is a kind of brush made with wires instead of hair, stuck through a sheet of leather; the wires not being perpendicular to the plane, but all inclined one way in a certain angle.

From this description, such as are totally unacquainted with the subject, may conceive that cotton, being stuck upon one of these cards or brushes, may be scraped with another card in such a direction, that the inclination of the wires may tend to throw the cotton *inwards*, rather than suffer it to come out. The consequence of the repeated strokes of the empty card against the full one, must be a distribution of the cotton more evenly on the surface, and if one card be then drawn in the *opposite* direction across the other, it will, by virtue of the inclination of its wires,

take

take the whole of the cotton out of that card, whose inclination is the contrary way.

In this mode, the operation of carding was formerly performed by hand with sheets of card nailed upon thin boards, which were drawn and scraped against each other, and the cotton or wool was evenly diffused over the surface, and freed from all the knotty or entangled parts. One of the cards being then turned and applied in an inclined position, so as to scrape with one edge over the surface of the other card, in the direction of its teeth, the cotton was, by a particular manœuvre, stripped off and coiled up into those short soft rolls which we have spoken of already under the name of *cardings*. Such, in all probability, was the process employed with little alteration, during the five last centuries in the woollen manufacture of this kingdom, and applied at subsequent periods to the preparation of cotton. The use of cards was most likely derived from the Netherlands, at or before the time our woollen manufactures were improved by the emigration of Flemish weavers to this country, during the reign of Edward III.

They continued to be imported hither till the year 1463, when the tradesmen and manufacturers of London, and other parts of England, having made heavy complaints to parliament of the obstruction to their own employment by the introduction of various foreign manufactured wares, an act was passed in the third year of Edward IV., prohibiting *wool-cards*, and various other articles of iron, steel, copper, &c. from being imported into this kingdom.

The hand-cards were succeeded by flock-cards, and these again by cylinder cards, as we have already observed, which were first attempted about the year 1763.

This machine consisted of two or more large cylinders covered with cards, revolving in opposite directions, and never in contact with each other, and surmounted by other smaller cylinders covered in like manner, by whose revolutions in various directions, and with different velocities, the cotton was carded and delivered to the last or finishing cylinder, from which it was stripped off by different contrivances. The cards were nailed on in stripes, or sheets of six or eight inches broad, and the margin of each sheet in which the nails were driven, being destitute of teeth, formed so many intervals or furrows across the surface of the cylinder.

The cotton was stripped off first by hand, as in Mr. Peel's machine, and afterwards by a fluted cylinder, or by a roller armed with slips of tin-plate or iron, standing erect like the boats of an undershot wheel, and which revolving quicker than the card, and in close contact with it, scraped off the cotton in distinct portions from each stripe or sheet, which fell into a receptacle below. This was a harsh and rude operation, and rubbed and injured not only the carding, but the cards themselves. Mr. Arkwright substituted for the fluted cylinder a plate of metal finely toothed at the edge, and moved in a perpendicular direction rapidly up and down by a crank.

The slight, but reiterated strokes of this comb, acting on the teeth of the cards, detached the cotton in a fine and uniform fleece. On the finishing cylinder also, narrow fillet-cards, as they are termed, wound round in a spiral form, were substituted for the ordinary cards nailed across.

The *continuity* of the fleece was thus preserved, which was destroyed before by the intervals or furrows we have alluded to, and being gradually contracted in its size, by pulling through a kind of funnel, and flattened or compressed between two rollers, was delivered into a tin can in one *continuous, uniform, perpetual carding*, so long as the machine

continued in motion, and was supplied with the raw material.

This is, without exception, one of the most striking and beautiful operations in the whole process of spinning. Mr. Arkwright's right to the invention of the crank and comb was the disputed point at the last hearing of this cause, and the evidence which he was unprepared to meet having proved to the satisfaction of the jury, the prior claim of a mechanic, named Heyes, his exclusive right, not only to this improvement, but to all others included in the same patent, was cancelled by the judgment of the court. How far Mr. Arkwright would have been able in the event of another hearing to have disproved the evidence thus unexpectedly brought forward, is not easy to determine. That the crank had been applied in some way or other, prior to the date of Mr. Arkwright's patent, though in a much less efficacious and approved manner, we believe will admit of the fullest proof, and this circumstance, in a case in which the interest of a great body of manufacturers was deeply concerned, and was opposed only by that of a single individual, would, in all probability, have confirmed the former decision in a court already weary of the discussion.

The improvement, as far as Mr. Arkwright was concerned, was original, and undoubtedly his own, and bears evident marks of that genius and happy invention which so strongly characterize every part of his machinery. He was anticipated in a single idea before it was matured and brought forth, and in this instance lost the fruits of his industry and talents. His claim to the spiral cards, which produce the endless, or perpetual carding, has however never been disputed. At the same time Mr. Arkwright brought forward other machines peculiarly adapted to the preparation of the materials for his own mode of spinning, and founded on the principle of his former invention. The first of these, in the series of successive operations, is the *drawing frame*.

This machine consists of a system of rollers similar to those before described in the twist frame, revolving with different velocities, either from the variation of size in the pairs of rollers, their performing a different number of revolutions in the same space of time, or from both these causes united. Three or more cardings coiled up in deep tin cans are applied at once to these rollers; in their passage through which, they not only coalesce so as to form one single *drawing*, but are also drawn out or extended in length. This process is several times repeated; three, four, or more drawings, as they are now termed, being united and passed between the rollers; the number introduced being so varied, that the last drawing may be of a size proportioned to the fineness of the thread into which it is intended to be spun. By this operation, the fibres of the cotton are drawn out longitudinally, and disposed in an uniform and parallel direction, and all inequalities of thickness are done away by the frequent doubling or joining of so many different lengths.

A third machine was contrived by Mr. Arkwright for giving the necessary degree of twist to these prepared lengths of cotton. In the state in which it comes from the drawing frame, it has little strength or tenacity, and is received into similar deep cans, from whence it was passed through the rollers. To enable it to support the operation of winding, it is again passed through a system of rollers similar to those in the last machine, and received in a round conical can revolving with considerable swiftness. This gives the drawing a slight twisting, and converts it into a soft and loose thread, now called a roving, which is wound by the hand upon a bobbin by the smaller children of the mill, and then carried to the spinning or twist frame, of which we have already spoken.

Such

COTTON.

Such are the inventions and improvements for which we are indebted to the genius of Mr. Arkwright, and which complete a series of machinery, so various and complicated, yet so admirably combined and well adapted to produce the intended effect in its most perfect form, as to excite the admiration of every person capable of appreciating the difficulty of such an undertaking. And that all this should have been accomplished by the single efforts of a man without education, without mechanical knowledge, or even mechanical experience, is most extraordinary, and affords a striking instance of the wonderful powers displayed by the human mind, when its powers are steadily directed to one object.

Yet this was not the only employment of this eminent man, for at the same time that he was inventing and improving the machinery, he was also engaged in other undertakings, which any person, judging from general experience, must have pronounced incompatible with such pursuits. He was taking measures to secure to himself a fair proportion of the fruits of his industry and ingenuity; he was extending the business on a large scale; he was introducing into every department of the manufacture a system of industry, order, and cleanliness, till then unknown in any manufactory where great numbers were employed together, but which he so effectually accomplished, that his example may be regarded as the origin of almost all similar improvements.

When it is considered, that during this entire period he was afflicted with a grievous disorder (a violent asthma) which was always extremely oppressive, and threatened sometimes to immediately terminate his existence, his great exertions must excite astonishment. For some time previous to his death, he was rendered incapable of continuing his usual pursuits, by a complication of diseases, which at length deprived him of life, at the Rock House, Cromford, on the 3d of August 1792, in the 60th year of his age.

The honour of knighthood was conferred on him in December 1786, on the occasion of presenting an address to his majesty.

In the infancy of the invention, sir R. Arkwright expressed ideas of its importance, which to persons less acquainted with its merits appeared ridiculous, but he lived long enough to see all his conceptions more than realized in the advantages derived from it, both to himself and his country; and the state to which those manufactures dependant on it have been advanced since his death, makes all that had been previously effected appear comparatively trifling.

The system of spinning introduced by sir Richard was found most particularly applicable to the production of thread for warp, whilst the *Jenny* of Hargreaves was chiefly employed in spinning the woof, or weft, for the coarse kinds of which it was better adapted, indeed, than the more perfect machine of sir Richard.

On these machines were spun for some years after their introduction all the twist and weft in the kingdom; the use of the *Jenny* has, however, since been almost wholly superseded by a third machine, called a *Mule*, for the invention of which we are indebted to the ingenuity of Mr. Samuel Crompton of Bolton.

The *mule* was invented about the year 1776, during the term of sir Richard's patent right, and did not on that account come into general use till after its expiration. It is a compound of the two machines of Arkwright and Hargreaves, and is considered, as its name imports, as the offspring of the twist frame and *Jenny*. It consists of a system of rollers like those of the twist frame, through which the roving is drawn and received upon spindles,

revolving like those of the *Jenny*, and from which it acquires the twist. The carriage on which the spindles are disposed is moveable, and receding from the rollers somewhat quicker than the thread is delivered, draws or extends it in the same manner as is done by the *Jenny*. See *MULE*.

This completes the series of machines now in use, and is the only important discovery in spinning since the invention of sir Richard Arkwright, on which indeed its chief merit is founded.

Of its excellence, and also of those other machines employed in the different preparatory processes, some idea may perhaps be formed, when it is stated that a pound of fine cotton has been spun on the *mule* into 350 hanks, each hank measuring 840 yards, and forming together a thread 167 miles in length.

Hitherto we have entered only into such details of the different processes of spinning as were necessary to elucidate the history of their invention, and exhibit both the sources and progress of the various improvements.

The operations which cotton undergoes in its passage from the raw material to the state of thread, are various and multiplied in proportion to the fineness required, and the different uses to which it is destined.

If we analyze these operations, they resolve themselves into the following: *Batting*, *carding*, *doubling*, *drawing*, and *twisting*. The three latter are never performed singly, but are variously joined in the same machine; and the same elementary processes are oftentimes repeated in different machines, with various and different effects.

With reference to these effects, the operations which cotton undergoes, may be denominated *batting*, *carding*, *drawing*, and *doubling*, *roving*, and *spinning*.

Batting, is that operation which prepares the cotton for *carding*, by opening and disengaging the hard compressed masses, in which it comes from the bales.

It is performed by beating the cotton with sticks on a square frame, across which are stretched small cords, about the thickness of a goose quill, with intervals sufficient to suffer the seed, leaves, and other adventitious matter to fall through.

When a hard matted or compressed mass of cotton is smartly struck with a stick, the natural elasticity and resiliency of its fibres, gradually loosen and disengage them, and the cotton recovers by repeated strokes all its original volume. During this operation the seeds, &c. which adhere, are carefully picked out by the hand, and the cotton rendered as clean as possible.

Batting is generally and best performed by hand, though the scarcity of hands and cost of labour have rendered other contrivances necessary. For a description of the *batting* machine, with other particulars relative to this operation, see *MACHINE*.

Carding, is that operation in which the first rudiments of the thread are formed. It is performed, as we have before stated, by cylinders covered with wire cards, revolving with considerable swiftness in opposite directions, nearly in contact with each other, or under a kind of dome or covering, the under surface of which is covered with similar cards, whose teeth are inclined in a direction opposite to those of the cylinder.

By this means the separation of almost every individual fibre is effected, every little knotty or entangled part disengaged, and the cotton spread lightly and evenly over the whole surface of the last or finishing cylinder, from which it is stripped by the contrivance we have already described.

For *Jenny* spinning, which is still in use for the coarser kinds

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kinds of thread, the cardings are stripped off in separate lengths. The finishing cylinder is covered with the ordinary cards nailed on in stripes across, and the cotton contained between the margins or intervals of each stripe, forms one carding, whose length of course depends on the width of the engine, or cylinder. When stripped off by the crank and comb, it forms a loose and shapeless film, which falling on the surface of a plain wooden cylinder, the lower half of which revolves within a hollow shell or casing, the cotton in its passage is rolled up and delivered at the other side in perfect and cylindrical cardings.

For mule or water spinning, the finishing cylinder is covered with spiral or fillet-cards, and the cotton being taken off in one continued fleece, and contracted by passing through the funnel and rollers, forms one endless and perpetual carding, which is interrupted only, or broken, when the tin can that receives it is compleatly filled.

In the Jenney carding, the fibres of the cotton are disposed across or at right angles to the axis of the carding; in the perpetual carding they are disposed longitudinally, or in the direction of its length, and it is this circumstance which renders the carding destined for mule or water spinning, inapplicable to the Jenney, and *vice versa*. For further details, and a description of the carding engine, we must refer our readers to the article ENGINE.

Drawing, and *Doubling*, is one of the preparatory processes for which we are indebted wholly to sir Richard Arkwright, and belongs exclusively to the mule, or water spinning.

The doubling, or passing three or four cardings at once through a system of rollers, by which they are made to coalesce, is intended to correct any inequalities in the thickness of the cardings, and also to admit of their being frequently drawn out or extended by passing through the rollers. The effect of this frequent drawing is to dispose the fibres of the cotton longitudinally, and in the most perfect state of parallelism. The operation of carding effects this in a certain degree; yet the fibres, though parallel, are not straight but doubled, as may easily be supposed from the teeth of the cards catching the fibres sometimes in the middle, which become hooked or fastened upon them. Their disposition is also farther disturbed by the taker-off or comb, which strips them from the finishing cylinder; and though the general arrangement of the fibres of a carding is longitudinal, yet they are doubled, bent, and interlaced in such a way, as to render the operation we are now speaking of absolutely necessary.

When the cardings have been passed four or five times through the drawing frame, every fibre is stretched out at full length, and disposed in the most even and regular direction; and though the average length of a fibre of cotton is not two inches, yet the finished drawing, as these prepared cardings are now termed, has all the appearance of a lock of Jersey wool, whose fibres, six or eight times as long as those of cotton, have been carefully and smoothly combed.

Rowing, is that operation by which the prepared cotton, as it comes from the carding engine, or drawing frame, is twisted into a loose and thick thread, and wound upon a spindle or bobbin.

In Jenney spinning, the cardings are roved without any other preparation, by a machine called a roving billy, for a description of which, with other particulars relative to Jenney spinning, see JENNEY.

In mule or twist spinning, the prepared carding or drawing, as it is termed, is again passed through a system of rollers, and is twisted, either by a rapidly revolving can, into

which it is delivered from the rollers, or by a fly and spindle similar to those of the flax wheel; in the latter case it is wound on the bobbin by the machine; in the former it is received in the conical can in which it acquires the twist, and is afterwards wound upon bobbins by the smaller children of the mill.

Sir Richard Arkwright always employed the revolving can, and it is still employed in many of the first mills in the country. The roving frame with fly and spindle, which is in fact nothing more than the twist frame of sir Richard, is now however very generally in use, especially since later improvements have removed objections to the machine, which rendered its use heretofore inconvenient. See FRAME.

The operations through which the thread passes after it has received the first twist are various, and depend greatly on the use it is intended for.

The finer it is required, the oftener it is drawn out and twisted, till by degrees, as in the process of wire-drawing, it is brought down to the fineness required. The rovings are therefore distinguished into first, second, and third, according to the number of operations they have gone through.

Spinning, is the last operation which the thread undergoes in the series of processes employed in converting it into thread, and is that in which it receives the final extension and twisting.

It is performed either on the Jenney, twist frame, or mule. Of these machines we have already spoken generally, and also of the nature of their operation; for further and more particular details, we must refer our readers to their proper heads.

Such are the operations by which the raw material is brought into the state of thread, and such the improvements by which the cotton manufacture of this kingdom has arrived at its present unexampled state of prosperity. We cannot give our readers a better idea of the effects immediately resulting from these various improvements and discoveries, than by the following extracts from a pamphlet, published in the year 1788, intitled, "An important Crisis in the Calico and Muslin Manufactures of this Country explained;" the purport of which was to warn the nation of the bad consequences which would result from the rivalry of the East India cotton goods, which then began to be poured into the market in increased quantities, and at diminished prices.

The author asserts, that, not above 20 years before the time of his writing, the whole cotton trade of Great Britain did not return 200,000*l.* to the country for the raw material, combined with the labour of the people; and at that period, before the introduction of the twist frame and Jenney, the power of the single wheel could not exceed 50,000 spindles:

In 1787, the number of cotton mills, as near as intelligence could be procured, was as follows:

In Lancashire	41	Flintshire	3
Derbyshire	22	Pembrokeshire	1
Nottinghamshire	17	Lanerkshire	4
Yorkshire	11	Renfrewshire	4
Cheshire	8	Perthshire	3
Staffordshire	7	Edinburghshire	2
Westmorland	5	Rest of Scotland	6
Berkshire	2	Isle of Man	1
Rest of England	6		—
	—		—
	119		24
	—		—

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The whole being 143, the cost of which was estimated at £ 715,000
 There were at the same time 550 mules, and 20,700 Jennies, containing, together with the water frames, 1,951,000 spindles; the cost of which, and of the auxiliary machine y, together with that of the buildings, is stated to have been at least 285,000
 The total expenditure being £ 1,000,000

These establishments, when in full employment, were estimated to produce as much cotton yarn as could be spun on the single spindle by a million of persons; and instead of diminishing the employment of the people as was apprehended, they called vast numbers from idleness to comfortable independence. At this time they were supposed to give employment to 26,000 men, 31,000 women, and 53,000 children in spinning alone; and in all the subsequent stages of the manufacture the number of persons employed, was estimated at 133,000 men, 59,000 women, and 48,000 children, making an aggregate of 159,000 men, 90,000 women, and 101,000 children, in all 350,000 persons employed in the different branches of the cotton manufacture.

The quantity of the raw material consumed in this manufacture, which in 1781 did not amount to 6,000,000 lbs., in the year 1787 exceeded 22,000,000. The astonishing rapidity of this increase, which will be more clearly shewn by the following statement, is to be in a great measure attributed to the extension of the manufacture to the goods of India, particularly calicoes and muslins.

Cotton used in the Manufactures of Great Britain.

Years.	Pounds.	Supposed value when Manufactured.
1781	5,101,920	£ 2,000,000
1782	11,206,810	3,900,000
1783	9,546,179	3,200,000
1784	11,280,238	3,950,000
1785	17,992,888	6,000,000
1786	19,151,167	6,500,000
1787	22,600,000	7,500,000

The cotton imported for the manufacture of 1787, was of the following growth:

British West India, estimated at	6,600,000 lbs.
French and Spanish settlements	6,000,000
Dutch Settlements	1,700,000
Portuguese ditto	2,500,000
East India, procured from Ostend	0,100,000
Smyrna and Turkey	5,700,000
	22,600,000

The application of this cotton to the different branches of manufacture was supposed, by intelligent persons, to have been as follows:

Candlewicks	-	1,500,000 lbs.
Hosiery	-	1,500,000
Silk and Linen mixtures	-	2,000,000
Fustians	-	6,000,000
Calicoes and Muslins	-	11,600,000
		22,600,000

In the branches applicable to muslin and calico alone, it was calculated that employment was given in England and Scotland to 100,000 men and women, and at least 60,000 children.

The progress of the Irish in the same line of industry must not be overlooked, and the laudable and spirited exertions of captain Robert Brooke deserve to be more particularly noticed. In the year 1780, that gentleman established a cotton manufactory on his lands situated on the great canal about 18 miles W. of Dublin. In 1782, the government of Ireland, understanding that some of the manufacturers of Manchester intended to remove to America, and carry their machinery with them, found means to persuade them to go to Ireland, and gave captain Brooke about 3000 l. for settling them in houses upon his lands, and they afterwards advanced him 32,000 l. upon interest and security, that he might give employment to a great number of weavers who were then starving and riotous for want of employment in Dublin. By means of these and other acquisitions of inhabitants, the manufacturing village which was called Prosperous, consisted now of several hundred houses, erected on a spot where, in the year 1780, there stood one single hut; and the manufacture gave employment to about three thousand men, women, and children. Besides captain Brooke's, which was the principal one, there were at this time several other manufactures of cotton established in various parts of Ireland by the spirited exertions of individuals, and the liberal encouragement of parliament.

It may be proper here to observe, that two spinning mills were established in France, near Rouen, under the direction of Mr. Holker, an English manufacturer, who, with his partners, was assisted and patronized by the French government: and it was not long before Arkwright's machinery was even transported across the Atlantic, and a spinning mill erected in Philadelphia.

Calicoes were first brought hither from India in the year 1631, and derived their name from the province of Calicut, where they were chiefly made or exported. They were first manufactured in this country about the year 1772, or 1773. Various attempts had been made previous to this time to manufacture cloth with cotton warp or web, but owing to the imperfection of the twist or yarn, spun either on the one thread wheel or Jenney, they all proved unsuccessful. The warp was too flimsy, and unable to support the stretch or tension of the loom, or when it did, too soft to form a cloth of firm and useful texture. The improvements that rapidly followed the introduction of machine spinning, and more especially those of sir Richard Arkwright, soon remedied this defect; yet, though most excellent yarn or twist was produced, the manufacturers could not at first be prevailed upon to weave it into calicoes. Mr. Strutt, therefore, of Derby, in conjunction with Mr. Samuel Need, both in partnership with sir Richard Arkwright, attempted the manufacture of calicoes about the year 1773, and proved successful; yet after a large quantity had been made, it was discovered that they were subject to double the duty (*viz.* 6d. per yard) of cottons with linen warp, and when printed were prohibited. They had therefore no other resource than to ask relief of the legislature, which after great expence and opposition, they at length obtained, and thus laid the foundation of a branch of manufacture which has since become one of the most important in the kingdom.

The manufacture of calicoes was begun at Blackburn, in Lancashire, about this period also, at first from twist spun in the neighbourhood upon Jennies, but afterwards principally from

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from the water twist. The goods manufactured here before the introduction of calicoes, were *Blackburn greys*, made of cotton wool, but linen warp of Hamburgh or Irish yarn, but chiefly of the latter. These goods, which were the calicoes of that day, were manufactured as early as the year 1727, at which period all the cotton goods, such as pillows, jeans, jennets, most of the cords and thickets were made with linen warp, and even the warps for dimities were half linen. The Blackburn greys were sold in the unbleached state to the calico-printers of London, and afterwards to those of Lancashire and Cheshire, till the introduction of the real calico put a stop to this manufacture about the year 1775.

Blackburn has since become the great mart for calicoes, and the chief source from whence the printers of Lancashire, as well as those of London and Scotland, are supplied.

The quantity manufactured, or rather sold there, (for the Blackburn houses employ weavers in all parts of the surrounding country, and even at considerable distances) amounted a year or two ago to upwards of one million pieces annually. The quantity now made is perhaps less than this, but of finer quality, a larger capital is employed, and the manufacture is on the increase.

The quantity of calicoes manufactured in the whole kingdom, not twenty years ago, was little more than half what the Blackburn market now affords, and it is probable that this forms but a small part of the quantity annually made in this country. They are chiefly printed into garments, shawls, and furnitures, both for home consumption, and a considerable foreign trade. The finer sorts are worn as dresses, white or plain, and large quantities are used for linings, and other purposes for which the coarser kinds of linen were formerly employed.

The lightness, as well as cheapness, of the calicoe, has rendered it a chief article of dress amongst all classes of people, and annihilated the manufacture of many of the lighter kinds of woollen and worsted stuffs, formerly so much in demand. The trade of Halifax, and the surrounding country, which consisted almost wholly in such stuffs, has gone entirely to decay, and been replaced by the manufacture of calicoes and other cotton goods: and such are the quantities now manufactured, more especially in the country around Colne, and thence to Bradford, that from 16 to 20,000 pieces are brought weekly to the Manchester market; the produce of those districts which adjoin, or are included between these two towns.

To the same improvements in spinning which gave birth to the manufacture of calicoes, we are indebted for that of muslin, a branch not less important to the country than honourable to our pride and industry as manufacturers. For this elegant article of dress all Europe had long been tributary to India, wherethe manufacture has, through the long lapse of ages, arrived at the greatest perfection. Muslins were first introduced into this country by the East India company, about the year 1670, before which time capribries and Silesia lawns were worn, and such fine linens from Flanders and Germany, as were brought back in exchange for our woollen manufactures of various kinds exported thither in considerable quantities. The manufacture was attempted at Paisley as early as the year 1700. A few looms were employed, but this trade was soon annihilated by the introduction of the goods of India. Eighty years afterwards a more successful rivalry commenced. British muslins were first successfully introduced in the year 1781, but were carried to no great extent till 1785, since which period their progress has been rapid beyond all example. In the year 1787, it was computed, that not less than

500,000 pieces of muslin, including shawls and handkerchiefs, were annually made in Great Britain. The manufacture has, from that time to the present, continued progressively to increase and improve, and bids fair to become the most lucrative and extensive of any in this country. The rapidity with which it approaches to perfection, and its surprising extent in the short space of twenty years, are amongst the many important consequences that have resulted from the improvements in the art of spinning.

By the cheapness and superior quality of our yarn, we are enabled to employ thousands of looms in the production of this elegant and useful article of dress, to keep in this country millions of specie which was heretofore sent to the East to purchase this commodity, and to clothe ourselves with this fabric at one-third of the expence formerly required.

The demand for, and the use of this article, are proportionate to its cheapness and elegance, and it is not difficult to see that it will become a staple manufacture of this country.

Glasgow and Paisley in Scotland, and Bolton in Lancashire, are the chief seats of this manufacture, which is however considerably extended over many other parts of the country. India still maintains her superiority in the finer kinds of muslin, some of which of most exquisite beauty and fineness are sold in this country, as high as ten or twelve guineas *per* yard. In productions like these, no rivalry can exist; in India they are looked on as master pieces of art, and the time employed by an Indian weaver in their production would ruin an European.

The common kinds, or such as are more adapted to general use, are also preferred by our English ladies to those of home manufacture, on the score of their enduring greater hardships and retaining their colour, or rather whiteness, better. This excellence, which exists to a certain degree, is the result of no superiority in the manufacturing processes, but in the raw material, of which that of India is the finest and best in the world.

Muslins were manufactured at Zurich and St. Gall in Switzerland long before we succeeded, yet such were the advantages which the improvements in spinning afforded us, that till within these few years (during which the unsettled state of the continent has interrupted, and in some countries annihilated, all commercial intercourse) we supplied all Europe with muslins, not only of Indian, but British manufacture.

Nankens and ginghams were manufactures, which, without the improvements of the spinner, could not possibly have succeeded.

These articles, like the two preceding, were formerly brought from the East exclusively. Fustians, dimities, jeans, quiltings, velvets, velveteens, and a variety of cotton goods, which the limits of our article will not allow us to particularize, have been improved to such a pitch, that Manchester has supplied all Europe with these fabrics.

Cotton hosiery forms no inconsiderable part of this immense manufacture, and it was the demand for cotton thread for the stocking weavers, that urged forward the improvements of Mr. Arkwright, and held out such strong inducements to those whose assistance first enabled him to give his invention to the world.

Exclusive of these various manufactures, great quantities of twist were exported to the continent, and a considerable part of the yarn spun in Manchester, before the late disastrous occurrences in Germany, was employed in the foreign loom. It was this demand for twist, which our continental rivals were unable to produce of equal quality

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or price with ours, which raised this branch of the cotton manufacture to a state of prosperity, of which some idea may be formed, when it is stated that the various establishments for spinning only in this country, when in full activity, give employment to near 180,000 persons, a number little short of that which is employed in France in all the different branches of the cotton manufacture together, and which, according to the report of Chaptal, late minister of the Interior, amounts to near 200,000.

The value of these improvements in spinning was so obvious and so important, that it is not surprising they were soon diffused over the continent, notwithstanding every precaution used to prevent it. By the emigration of mechanics, and the clandestine exportation of machinery constructed here, our neighbours soon became possessed of our improvements, and had we paused in our exertions, the superiority we had acquired would long ere this have passed away. France, as we have just observed, has a great population employed in the manufacture of cotton. Prussia and Germany have many and increasing establishments, and in the two former countries, and in the hereditary dominions of the emperor of Germany, our piece goods have been long prohibited.

Our spinners however, by their ingenuity, and the improvement and perfection of their machines, have still kept the lead; and the attention of our manufacturers is now directed to the perfection of those operations more immediately connected with the labours of the loom, in which, till within these few years, little has been done. Every day brings forth new discoveries, and it is not difficult to see that what has already been achieved, and what, from the general spirit of improvement which is now abroad, must inevitably follow, will soon place us far beyond the reach of competition in the manufacture of cotton goods, and give us advantages greater than ever we enjoyed since its first establishment in this country. Before we enter into such a detail of these improvements however, as will enable our readers fully to comprehend their nature and extent, it will be proper to take a short view of the different operations and processes through which the thread passes in its progress from the hands of the spinner to the loom.

The thread is of two kinds, viz. *twist*, so called from its being harder twisted than the other, forming a flouter thread, and used for the web or warp of piece goods, and *weft*, which is a looser, softer thread, and used for the woof. The *weft* is delivered to the weaver in small oblong rolls called *cops*; in the state they are stripped off the spindles of the mule or Jenny. When these are used, a small pointed piece of wood or skewer is carefully passed through the axis of the cop into the place formerly occupied by the spindle, and one end of it being held between the teeth, the thread is wound off the cop upon the weaver's bobbin by a wheel somewhat smaller in size, but the same in principle as the common one thread wheel on which all the spinning was formerly performed.

This is generally done by children, and the bobbins are then ready for the shuttle. Twist undergoes several operations before it is ready for the loom. It is delivered by the spinner either in *hank*, or *cop*.

Hank twist is that which is spun on the water frame, from the bobbins of which it is *reeled* into hanks of a determinate length, each measuring 840 yards. The value and fineness of the thread are proportionate to the number of hanks in a pound, and they are denominated by numbers, as Nos. 20, 50, 100, &c. which express the hanks which a pound of twist contains. In this state it is generally *sized*,

an operation which is intended to give additional strength and tenacity to the thread, and enable it to support the different operations in its passage to the loom. It consists in impregnating the thread fully with thin size, chiefly formed of wheat flour boiled in water, with the addition of a little glue. The twist is carefully worked in this and afterwards wrung and dried. The thread acquires considerable strength by this operation, and the loose fibres are all firmly attached or glued to its surface. It is then delivered to the winder.

Winding is that operation by which the thread is transferred to the warping bobbin, either from the cop, hank, or twist frame bobbin.

Formerly this was chiefly done by females, and the work was carried home and performed by any of the family not engaged in domestic concerns, on a small wheel that turned two bobbins at a time.

This mode is still in use, but the work has been greatly abridged and facilitated by the use of machines of various constructions, for a description of which, see *MACHINE*.

Cop twist is that which is spun on the mule or Jenny. It is reeled only occasionally to ascertain its value and fineness, and is delivered in cops to the winder.

The next operation is that of *warping*, or the formation of the web. The machine on which this is performed is an octagonal prism five or six feet high, and somewhat less in diameter, revolving vertically, and put in motion by a band and pulley placed under the seat of the warper. The bobbins which furnish the thread are suspended horizontally in a frame on one side. Twenty-eight or thirty threads, forming together a system called a *half beer*, are wound round the prism in a spiral form from top to bottom. The machine is then turned the contrary way, and the thread wound round the prism upwards from bottom to top, and this is repeated backwards and forwards till a sufficient number of *half beers* have been wound to form a web of the breadth required.

When finished, and the ends properly secured, the whole is wound off and coiled upon the hand into a round ball called the *warp*. For further particulars of this operation, and a description of the machine, see *MILL*.

If the thread has been previously sized in the hank, it is now ready for the loom, but if the warp is made of cop twist, that operation is next performed.

The warps are boiled several hours in water till they are thoroughly penetrated and softened; after draining some time they are then uncoiled and worked in the size till fully impregnated, after which the superfluous size is squeezed out, and they are suspended on poles to dry: the warp is then ready for the loom.

Without this operation of *sizing*, which, as we have before observed, gives strength and tenacity to the thread, it would not support the friction of the loom. Two threads are passed between each dent of the reed, and at each stroke of the treadle one ascends whilst the other descends. There is therefore a constant friction of the threads upon each other, as well as against the teeth of the reed. The motion of the reed itself also backwards and forwards, and of the beards up and down, is very severe upon the warp, and unless it has been well penetrated by the size, and its fibres well cemented or glued together, this continual rubbing is sufficient to destroy its texture.

Good sizing prevents this, but it is still further aided by another operation called *dressing*, which is performed by the weaver himself after the warp is got into the loom. This consists first in applying with a brush a kind of paste made

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of wheat flour well boiled, to which is often added a small portion of common salt; sometimes of potash, and sometimes even a little tallow.

It is in fact a repetition of the operation of sizing, with this difference, that the dressing is applied chiefly to the surface of the thread, which is slightly smeared with the paste, and brushed uniformly in one direction from the healds to the beam, by which means the loose fibres are all disposed evenly one way, and firmly glued fast to the thread.

In summer the warp is dried simply by fanning it, but in winter, and in damp cold weather, a hot iron is lightly passed over it. It is then dressed again with a brush dipped in tallow or butter, with which it is slightly greased. This gives suppleness and smoothness to the thread, and greatly diminishes the friction of the healds and reed. As such a portion of the warp as is extended between the healds and beam can alone be dressed at one time, this is woven, and the dressing repeated again upon another portion, and so on alternately dressing and weaving till the whole of the web is finished.

Various improvements on these different processes have taken place during the last six or eight years, which have made greater or less progress in proportion to their importance. We shall enumerate, therefore, not only those of recent date, but such as, though known some time, have not been generally adopted.

The weaver's bobbin is still wound by hand in the manner already described, though the use of a small machine, by which twenty bobbins or upwards are wound at once, is daily gaining ground. They are to be seen now in almost every weaver's cottage where several looms are employed. This labour is further abridged by a very ingenious contrivance for which a patent has been obtained. The cops, instead of being wound, are compressed or squeezed till they are small enough to enter the shuttle. The winding here is done away, and the cops thus compressed are preferred, by the weavers to the common bobbin. In those large establishments where the different processes, such as spinning and weaving, are carried on together, the cops are spun small enough to enter the shuttle without compression. The web is transferred at once from the spindle of the mule to the weaver's shuttle, and the time and waste of winding, and even of compressing, saved entirely.

On the same principle also, a considerable reduction has been made in the labour of reeling and winding twist. Till within a late period, the practice has uniformly been to reel it into hanks from the bobbin it was spun on, to size it in the hank, and then wind it for warping. An obvious reduction of this labour is to warp it directly from the bobbin it is spun on, and size it in the warp like cop twist. For reasons, however, which it will not be necessary here to enter into, this has been found impracticable. It is, however, transferred to the warping bobbin without the intermediate labour and waste of reeling, and the sizing is done in the warp.

Considerable improvements in the mode of sizing have been made within these few years, especially in the sizing of warps.

Formerly, the practice was to work the warp in the warm size by the hand, the heat of which was of course limited to that degree which could be readily borne by the workman. Experience having proved that the hotter the size, the more evenly and perfectly was the warp penetrated, various contrivances were adopted for applying it at a high temperature. Amongst others are oblong troughs furnished with several pairs of rollers, through which the warp passes, and is strongly compressed whilst immersed in the hot size.

Mr. Marsland's idea of placing the twist in an exhausted receiver, and admitting the hot size, promises considerable advantages in some cases, and when the plan has been matured, will no doubt be susceptible of many applications.

But the greatest improvement that has been made in these different processes, and one that must eventually effect a complete revolution in the whole system, is Messrs. Ratcliffe and Rofs's mode of dressing. Hitherto this operation has been performed by the weaver in the manner we have already described, at the expence of one-third of his time and labour. As it is only possible for him to dress at once as much of the work as is contained between the healds and beam, he is scarcely got settled to his work, after each operation, before he is again called off to dress another portion. By this continual interruption of one species of labour by another totally different, it must be obvious to every one, that not only much time is lost, but that the labour itself cannot be equally well performed.

There is a delicacy and certainty of touch in weaving, dependant on long habit and experience, and on which the evenness and goodness of the cloth depends.

If the force with which the woof or weft is driven up by the reed, be not always alike, if it is greater at one time and less at another, the cloth will be thicker and thinner at those places, and such is the nicety on which this depends, that the most experienced weaver, after an interruption of some hours, cannot at once regain it.

Messrs. Ratcliffe and Rofs dress the whole of the warp before it is wound upon the beam, the labour of the weaver is therefore uninterrupted, and his attention directed solely to one object. This alone is a great point gained, but it is attended also by other, not less important, advantages. Great part of the intellectual skill required in weaving is in the dressing and beaming of the warp; the mere mechanical part of throwing the shuttle, &c. is soon acquired, even by a boy. A more accurate division of labour, by reducing the beaming and dressing to a system by which they are better, more economically, and more expeditiously performed than before, has removed the great difficulty in the art of weaving, and rendered it in a great measure the employment of children.

From what we have already said, it will appear that the object in dressing and sizing is nearly the same, and Messrs. Ratcliffe and Rofs, by this improved mode of dressing, have succeeded in reducing these operations to one. They have gone still further; they have done away the necessity of warping, by forming the web at once from the bobbin, and thus reduced the warping, sizing, dressing, and beaming, to one operation. A thousand bobbins and upwards supply the materials for the warp, which in its progress is properly disposed and arranged, sized, dressed, and finally wound upon the beam. This improvement, which may justly be regarded as the most important that has taken place in weaving since the invention of the fly shuttle fifty years ago, must in the end effect a complete change in the system of labour. Great however as its advantages are, some time must necessarily elapse before it can be accommodated to general use. In large establishments, where the different processes of the manufacture are carried on together, such as spinning, weaving, and the labour immediately connected with them, it has been adopted with the happiest success, but the weaving in this country is chiefly done in the cottages of the poor, and to their use the costly and bulky apparatus of Messrs. Ratcliffe and Rofs is not adapted.

To derive all the advantages possible from this improvement, therefore, it will be necessary either that the weaving

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be done in large shops, to each of which a dressing machine may be attached, or that the warps be delivered to the country weavers ready dressed and wound upon the beam. The former plan is daily gaining ground, and perhaps it is not difficult to foresee, that at no very distant period all the weaving of the country will share the fate of the spinning, and quit the cottage for those larger establishments in which it will be susceptible of better management, and more accurate division of labour.

The last improvement, which we shall notice in the manufacture of cotton, and which, when once established, will compleat what Arkwright has so happily begun, is that of weaving by machinery. Various attempts have been made of late years to apply the great moving powers, steam, and water, to the common loom. Mr. Dolignon, many years ago, constructed a loom adapted, as we are told, to the manufacture of all kinds of cloth. It might be wrought by the power of wind, water, steam, or animal strength, and possessed an instinctive capacity (if we may be allowed the phrase) of knowing when any thread of the weft or warp was broken, in which case the loom ceased its motion, thus calling on the attendant to repair the damage, which being done, it immediately went on as before; six of these looms might be attended with ease by a girl of sixteen, or an aged or infirm person of either sex. The inventor did not live to reap the fruit of his labour, nor to introduce his machine properly to the world. He died soon after its completion, when he had brought it to a state of perfection satisfactory to himself, and with him perished the result of his industry and talent. Such is the account which the friends of Mr. Dolignon give of this invention: since that time several other looms of similar construction have been invented.

Mr. Austin of Glasgow has produced one, a model of which is deposited at the house of the Society of Arts in the Adelphi, in favour of which numerous testimonies were transmitted to the secretary. In the year 1798, a loom of this construction was set to work at Mr. Monteith's spinning works near Glasgow, which answered the purpose so well, that a building was erected by Mr. Monteith for containing thirty looms, and afterwards another to hold about 200.

The model deposited in the Adelphi is an improvement on those first made for Mr. Monteith, whose name we do not however see amongst the list of those who bear testimony to its value. A loom of this kind, says the inventor, occupies only the same space as a common loom. The expence is about one-half more. The reeling, winding, warping, beaming, looming, combing, dressing, fanning, greasing, drawing bores, shifting heddles, rods, and temples, which is nearly one half of the weaver's work, together with the general waste accompanying them; all which occur in the operation of the common loom, do not happen in this, which by its single motion, without trouble, performs every operation after the spinning, till the making of the cloth is accomplished. One weaver and a boy are sufficient to manage five looms of coarse work, and three or four of fine work. The construction of this loom is so complicated, that the Society have not, in their Transactions, given the public a drawing of it, conceiving that a model only could render it intelligible.

Other looms of a more simple, and consequently of more useful construction, have been invented by Messrs. Horrocks and Marsland of Stockport near Manchester, which, combined with the dressing machine of Messrs. Ratchiffe and Rofs, promise to be of considerable utility, and have already been tried on a sufficiently extensive scale by the inventors. The dressing machine, indeed, has removed the

great difficulties in machine weaving, and without it nothing important or advantageous could have been accomplished. It has also rendered the machine loom itself of less importance, by simplifying the art of weaving so much as to render that the employment of boys, which was formerly entrusted only to experienced weavers. To the rapid extension of this improvement, however, there are objections at the present moment arising from moral as well as political considerations which must greatly retard its progress, and we must look to happier times for the proof of its general utility, and its final adoption or rejection.

The preceding sketch, short and imperfect as it is, will serve to convey some idea of this immense and important manufacture. Of the population at present engaged in it, and of its annual value, we have only such conjectures to offer as are founded on those materials which are within the reach of individuals, and unless government order such an enquiry, it can only be estimated by the importation of cotton, which is for the most part manufactured at home.

Perhaps the manufacture of Scotland, as being in a narrow field, is more within the reach of observation than that of England; we therefore venture to lay before our readers, as being apparently an approximation to the truth, the following,

Estimate of the state of the cotten manufacture in Scotland, made up in the year 1796 at Glasgow, the centre of the principal commerce and manufactures of that kingdom.

39 water mills, which cost for machinery and buildings 10,000 l. each	£ 390,000
and work 124,800 spindles	
1200 Jennies 84 sp. each 100,800 at 6l. each	7,200
600 mules 144 sp. each 86,400 at 30l. each	18,000

Total, working by day and night } 312,000 spindles.

Building for the Jennies cost - - - 75,000

Capital vested in machinery and buildings £ 490,200

The yarn annually spun is valued at £ 1,256,412
 The cotton 4,629,043 lbs, average value 2s. 462,904

The people employed are estimated at 25,000 of both sexes, young and old, but the greater part under 15 years of age, whose labour, aided by machinery, thus improves the value of the raw material in the first stage of manufacture.

From which deduct wages estimated at 793,508
 500,000

Remains for cost, and wear and tear of machinery, and proprietors profits, the sum of } 293,508

The annual value of calicoes and muslins, now deservedly esteemed the staple of Scotland, when finished, including the excise duty on a part of them which are printed, and the cost of tanbouring and needle work on about a third part of them, was then estimated at £ 3,108,549

Value of the cotton yarn as above } £ 1,256,412

Yarn got from England 520,000. £ 1,776,412

The

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The wages of weavers, tambourers, needle-workers, the charges, the profits of the manufacturers, and the revenue paid to government, thus amounted to £1,332,137

Which great sum is produced by capital, ingenuity, management, and labour in the subsequent stages of the business.

The cotton manufacture in Scotland } employs - - -	}	38,815 weavers.
For winding warp and weft		12,938 women.
And supposing $\frac{1}{4}$ of the muslin adorned with needle work	}	105,000 women.
and girls most children.		
Besides those employed in the spinning branch	}	25,000
Hence it appears that - - -		181,753 persons

derive their immediate subsistence from the cotton manufacture in Scotland, and also a proportional number in England, employed in producing yarn to the value of 520,000 *l.*; besides the innumerable people of all classes concerned in providing necessaries and accommodations of every kind for that great multitude, and in constructing and repairing the machinery and buildings; and the cultivators of the cotton in the East and West Indies, seamen, merchants, &c. who are all wholly or partly supported by this most beneficial manufacture, by which the cotton is raised, taking the whole manufacture together, to about seven times the value it was of when imported.

The cotton manufacture has increased very much in Scotland since the year 1796. The imports of cotton into the kingdom in the year 1800, were nearly treble those of the year 1796. The printing business however appears to have declined a little, as may be inferred from the following

Account of the Calicoes, Muslins, Linens, and Stuffs, printed in Scotland in the years 1796 and 1800.

	1796			1800.		
	Rate of Duty.	Yards.	Amount of Duty.	Yards.	Amount of Duty.	
	<i>d.</i>		<i>£.</i> <i>s.</i> <i>d.</i>		<i>£.</i>	<i>s.</i> <i>d.</i>
Foreign Calicoes and Muslins - - -	7	141,403	4,124 5 1	78,868	2,300	6 4
British Calicoes and Muslins - - -	3 $\frac{1}{2}$	4,258,567	62,103 19 1 $\frac{1}{2}$	4,176,939	60,913	13 10 $\frac{1}{2}$
Linens and Stuffs - - -	3 $\frac{1}{2}$	1,185,500	17,288 10 10	1,220,714	17,802	1 7

In England and Wales, on the contrary, the printing business has increased during the above period, as will appear from the following

Account of the Calicoes, Muslins, Linens, and Stuffs, printed in England and Wales in the years 1796 and 1800.

	1796.			1800.		
	Rate of Duty.	Yards.	Amount of Duty.	Yards.	Amount of Duty.	
	<i>d.</i>		<i>£.</i> <i>s.</i> <i>d.</i>		<i>£.</i>	<i>s.</i> <i>d.</i>
Foreign Calicoes and Muslins - - -	7	1,750,270	51,049 10 10	1,577,536	46,011	9 4
British Calicoes and Muslins - - -	3 $\frac{1}{2}$	24,363,240	355,297 5 0	28,692,790	418,436	10 5
Linens and Stuffs - - -	3 $\frac{1}{2}$	3,464,862	50,529 4 11	3,232,073	47,134	7 11

If we follow the calculation assumed in an estimate laid before a committee of the house of commons, that the duty is one tenth of the value, we may estimate the value of the British calicoes and muslins printed in England and Wales in 1796, at £3,552,972 0

And those in 1800 at 4,184,365 0

From these statements, which are official, it appears that in 1800 there were printed about a million and a half of calicoes and muslins in Great Britain, exclusive of linens, stuffs, and foreign calicoes. From that time, to the year 1806, the business has continued progressively to increase, the amount of duties on printed goods for that year being

upwards of 600,000 *l.*, which will bring the number of pieces printed nearly to two millions.

The quantity of white calicoes and muslins made in England and Wales, is certainly much greater than that of the printed; probably not less than three million pieces annually.

From the signatures to the petition of the journeymen calico-printers to the house of commons in the year 1806, it would appear that, in Great Britain and Ireland, the number is 7000; we suspect however that this number includes apprentices, and that the list also has been swelled, as is usual in such cases, by unfair means.

During

During the progress of the work we shall have frequent opportunities of reverting again to the subject of the cotton manufacture, and of supplying those omissions which, in a business of such magnitude and extent, when submitted to individual investigation, must unavoidably occur. We shall conclude therefore with observing that, from the best information we have been able to collect, and from calculations founded on the quantity of the raw material imported into the country and of goods exported, it appears that the cotton manufacture of these realms gives employment to 800,000 persons, and that its annual value is upwards of 30 millions.

COTTON Paper. See PAPER.

COTTON, *Philosophic*, a name given by some chemical writers to the flowers of zinc, from their whiteness, and silky or cottony appearance.

COTTON Silk. See BOMBAX.

COTTON Thistle. See ONOPORDUM.

COTTON Tree. See GOSSYPIMUM.

COTTON-Weed. See ATHANASIA, and GNAPHALIUM.

COTTONARA, LE CANARA, in *Ancient Geography*, an extensive country of the peninsula of India, on this side the Ganges. Pliny says, that pepper was exported from it in canoes to Barace, a sea-port situated at the mouth of the river Baris. It produced an excellent pepper, called *cottonaricum*. This maritime country was situated between the mountains and the sea, and was about four or five leagues in breadth.

COTTONIAN Library, consisting of curious manuscripts, &c. was founded by sir Robert Cotton, who was forty years in collecting it; and at his death, in 1631, left the property of it to his family, though designed for public use. A large accession was made to this library by private benefactions before the death of the founder, and afterwards by the purchases of his heirs, and donations of others, who added to it a great number of books, chiefly relating to the history and antiquities of our own nation. An act of parliament was obtained, at the request of sir John Cotton, in 1700, for preserving it after his decease, under the above denomination, for public use. It is now fixed in the British Museum. For statutes relating to it, see 12 and 13 W III. c. 5, and 5 Anne, cap. 30.

COTTONIANUS Codex, in *Biblical History*, a manuscript of part of the New Testament, containing the portions of the Acts of the Apostles, and of the Epistles appointed to be read throughout the whole year; and deposited in the Cottonian library. It is said to have been written in the 11th century. Casley collated it in 1735, and Wetstein has inserted his extracts. In the same library is another MS. containing only the following fragments: Matth. xxvi. 57—65. xxvii. 26—34. John. xiv. 2—10. xv. 15—22; and having in several places corrections. Wetstein collated it in 1715. This MS. is written on paper, though with uncial letters. Both Le Long and Wetstein call it "Charta Egyptiaca purpurei coloris."

COTTS, in *Rural Economy*, a word often provincially employed to signify such tame lambs as have been brought up by the hand, in consequence of the mother having died. See CADE Lamb.

COTTUS, in *Ichthyology*, a genus of fishes in the thoracic order. The head is broader than the body, and spinous; the eyes placed vertically, and furnished with a militant membrane; the gill membrane, with six rays; body round, without scales, and tapering towards the tail; dorsal fins one, sometimes two. Linn. Gmel. &c. La Cèpede divides the Linnæan genus *Cottus* into three distinct genera, the first of which he retains under the Linnæan

name, the two others are his *Aspidophore*, and *Aspidophoroides*. This arrangement is approved by the later French writers, and by this means the cottus tribe is reduced to nine species. The cottus (cotte) of the French are distinguished by having the head larger, or more bulky than the body, and in general of a somewhat conic form; the dorsal fins two; the head, or gill-covers, armed either with spines or tubercles, and more than three rays in the thoracic fin.

Three species of the cottus genus are found in Britain, two of the marine kind, and the other an inhabitant of our fresh water streams; these are the *cataphractus* or pogge, the father-lasher, *C. scorpius*; and the *C. gobio*, or river bull-head. One or two other kinds inhabit the European seas, and the rest are chiefly natives of India.

Species.

CATAPHRACTUS. Body octangular, mailed; upper jaw armed with two upright bifid spines; throat fringed with numerous cirri. Gmel. Armed bull-head. Penn. Donovan. Brit. Fishes, &c.

The head of this fish is large, bony, and rugged, the mouth placed beneath and lunated; the body covered with strong bony crusts, divided into several compartments, the ends of which project into a sharp point, forming an echinated appearance along the back and sides from the head to the tail; and the back and sides, which are of a brown colour, as well as the head, are usually marked with three or four large dusky spaces; the body beneath white. The armed bull-head grows to the length of four or five inches, or rarely exceeds six inches, and is found on the sea-coasts.

QUADRICORNIS. Four bony protuberances in the middle of the head. Linn. Four-horned bull-head.

A figure of this species is given in the Mus. Adolp. Fred. pl. 32, and also in the work of Bloch. Its general appearance bears a strong resemblance to the common father-lasher of our own coasts, but differs specifically in having the four bony protuberances on the head as before mentioned, two of which are situated towards the middle of the head, and two behind. The prevailing colour is olivaceous, marbled with brown; beneath whitish; pectoral fins very large and rounded. It is found in the Baltic and Mediterranean sea, near the entrance of rivers, and sometimes wanders into the fresh waters. In the spring season it is taken in great plenty in the Düno in Livonia, and near Dalerow in Sweden. This fish grows to the length of ten or twelve inches, and is observed by the assistance of its pectoral fins, which are of very considerable size, to swim with great rapidity.

SCORPIUS. Head armed with numerous large spines; upper jaw rather longer than the lower. Linn. Father-lasher, or sea-scorpion. Donovan. Brit. Fishes, &c.

Inhabits the shores of Europe, Newfoundland, and Greenland, and rarely attains to a large size, being usually found about six or eight inches in length; those of twelve or fourteen inches long are very uncommon, except in the northern seas. It is a fierce and active fish, and will defend its haunts against the attack of sharks, and other large predacious creatures, which it annoys by means of its spines. The body is compressed, tapering towards the tail, and of a brown colour, variegated, dotted, and lined with white. The flesh is eaten in Greenland, and also in various parts of Europe, but the vulgar have a superstitious idea that the head is poison, and therefore cut off that part before they dress it.

GRUNNIENS. Body smooth; throat with numerous cirri. Gmel. Grunting bull-head.

A species found in the East and West Indies. Nieu-

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hoff saw it in the East, and Maregrave in Brasil: it was first described by the last mentioned author, and it is supposed the fish he mentions under the name of *pacam* is still a variety only of the same fish. In Brasil it is called *niqui*.

The length of this fish is from six to eight inches; the colour brown, varied with white on the sides; the fins pale spotted with brown, and the whole surface marked with numerous pores, through which a mucous fluid exudes with which the flesh is impregnated, and which renders the fish unwholesome, if not dangerous, as an article of food, notwithstanding the flesh itself is of an agreeable flavour. The head is large; the eyes small; mouth very wide; tongue and palate smooth; lips strong; teeth sharp, distinct, removed, and placed in several rows; the gill-covers consist of a single piece, and are armed with three or four spines; the opening of the gills is very wide. It is called the grunting bull-head, because, when first taken, it makes a peculiar kind of noise, not much unlike the grunting of a pig, occasioned, as it is concluded, by the sudden expulsion of the air from the internal cavities through the gill-covers and mouth.

SCABER. Head and lines down the body covered with serrated scales; lateral line aculeated. Linn. Rough bull-head.

A native of the Indian seas. The head is oblong and flatish; the body rather compressed, blue on the back, with the rest silvery, tinged with blue, and marked with six or seven moderately broad and distant rufous bands. Its fins are blueish, spotted on the rays, and variegated on the membranes with brown. The species feeds on testaceous animals, and crabs. In the "System of Ichthyology," published by Bloch, it constitutes, with another analogous fish, a new and distinct genus under the name of *platycephalus*; this genus is distinguished by having the body very flat, and the ventral fins placed at a considerable distance from each other. The rough bull-head is the *cotte raboteux* of French writers.

INSIDIATOR. Head with acute lines above, and two spines each side. Gmel. Forkal. Insidious bull-head.

Larger than the common European bull-head, but in other respects much resembling it. The species was discovered by Forkal in the Red Sea, where it grows to the length of nearly two feet. It is of the littoral kind, frequenting the coasts, and concealing itself under the sand, from whence it springs on such of the smaller fishes as happen to approach its haunts. The body is depressed, and of a tapering form; the colour of the upper part grey, with brown points and spots, beneath white. The tail is whitish, with a yellow bifid spot in the middle, and two unequal black, linear ones placed obliquely.

GORIO. Smooth; gill-covers armed with a crooked spine turning inwards. Gmel. Linn. Miller's thumb, or river bull-head. Donovan. Brit. Fishes, &c.

This species inhabits clear waters in most parts of Europe. Its usual length is from six to seven inches. The general colour yellowish-olive, darkest, and more clouded on the back and head; the lower part white. This fish swims with great swiftness when in search of prey, and is like the rest of its tribe, esteemed of the voracious kind. The river bull-head often lays concealed either among the gravel, or under stones at the bottom of the water, where it finds abundant supply of food in the larvæ of aquatic insects, and the spawn or young fry of other fishes.

JAPONICUS. Body octangular, mailed with prickly bony scales; no cirri. Gmel. Pallas. Japanese bull-head.

First described by professor Pallas, who informs us it is a native of the seas about the Kurile islands, and grows to the

length of about a foot. The colour is yellowish-white with the back dusky or brownish, and rough beneath. Like the armed bull-head the body is protected by a bony rugged covering or crusts disposed into eight prominent lines along the body. The head is elongated and compressed, the upper part rather flattened, and marked with a longitudinal channel. The snout is obtuse and divided into two lobes; the jaws armed with a great number of teeth of small size; the eyes are situated towards the end of the snout, and over each is a small protuberance; the gill-covers are denticulated at the edges; the fins marked with dusky streaks, and having the rays very rough.

MASSILIENSIS. Head armed with numerous spines; dorsal fins united. Gmel. Linn. Marseilles bull-head.

Nearly allied to the *cottus scorpio*. It is a native of the Mediterranean sea, and is said to occur about the coasts of Marseilles. The first twelve rays of the dorsal fin are spinous, as are likewise the three anterior ones of the anal fin.

MADAGASCARIENSIS. Scaly, with two curved spines on each side the head, and a longitudinal middle furrow between the eyes. *Le Cotte Madagasse*, La Cèpede. Madagascar bull-head.

Described and figured in the third volume of La Cèpede's work from the manuscripts of Commerçon, who discovered the species on the coast of Madagascar. It is said to be allied in some degree to the river bull-head, but is longer in proportion, and of superior size. The head is depressed, and the eyes are situated very near each other on the upper part of the head; the pectoral fins of moderate size, and rounded form; the body covered with large scales. La Cèpede observes on the authority of Commerçon's drawing, that the tail is divided by two indentations into three distinct rounded lobes, and hence this writer was almost induced to constitute a new genus of this fish. It appears, however, very doubtful from the appearance of this drawing whether the tail be really so divided or not; from it may be, with equal propriety, inferred by consulting the drawing that the artist intended only to represent two dusky marks or spots instead of indentations; and it must therefore remain with future observers to determine whether this rare and curious fish exhibits such a peculiar and very striking character. From its general aspect we can scarcely think it fairly entitled to a place in the *cottus* genus.

NIGER. Black or blackish, with a single spine each side of the head; lower jaw longer; body covered with hard scales. *Le cotte noir*, La Cèpede. Black bull-head.

This also is a native of the African seas, where it was found by Commerçon, and is described in the work of La Cèpede. In size and habit it resembles the black Goby. The second dorsal fin, as well as the ventral fin, is speckled and bordered with deep black; the anterior fin marked by two longitudinal blackish bands, and clouded with yellow. The head is thick, and largest at the posterior part, where it is armed on each side by a small spine, and appears somewhat swelled or inflated. The mouth is very wide; and both jaws are armed with a row of small, short, close-set teeth resembling those on the bony protuberances near its throat. The body is black or blackish, and is covered with very rough scales.

MONOPTERYGIUS. Head unarmed; dorsal fin single. Gmel. Single-finned bull-head.

Found in the Indian seas about the coasts of Tranquebar. The body is slender, and covered by an octangular bony mail, which towards the tail becomes hexagonal. The eyes are situated near the top of the head; they are of a large size, the form oblong, colour silvery with the pupil black. The upper jaw is longer than the lower, and is furnished with

with two recurved spines; the gill-covers consist of a single plate. On the upper parts the colour of this fish is brown, becoming whitish on the sides, and marked with a few transverse reddish-brown bands and spots. The abdomen is white. In general all the fins are cinereous, and have the rays split; the pectoral fin is long and broad, and is, as well as the tail-fin, spotted with brown.

AUSTRALIS. Whitish, with the head aculeated, and body marked with transverse livid bands. Shaw. Gen. Zool. Southern Cottus. White Journ. Bot. Bay.

Described by Dr. Shaw as a doubtful species in Mr. White's voyage to Botany bay. The length is stated at about three inches and a half; the colour yellowish-white, tinged with brown on the upper parts, and variegated by three or four transverse blackish bands; the head armed with pretty numerous strong spines both in front and on the gill-covers; eyes large, and body covered with minute scales.

COTTUS is also a name given by some writers to the **CALLIONYMUS Lyra** of Gmelin, or dracunculius, yellow gurnard, or gemmeous dragonet of other writers; and also to the **CALLIONYMUS Dracunculus**, or fordid dragonet of Pennant.

COTUENTII, in *Ancient Geography*, a people of Rhætia, according to Strabo.

COTULA, in *Botany*, (from *κοτυλη*, a cavity, some of the species having a hollow space under the receptacle; or, according to Ventenat, the diminutive of Cota, a name given by the older botanists to a species of anthemis.) Linn. Gen. 968. Schreb. 1310. Willd. 1515. Gært. 946. Juss. 184. Vent. 2. 549. Class and order, *Syngenesia polygamia superflua*. Nat. Ord. *Compositæ discoidæ*, Linn. *Corymbiferae*, Juss.

Gen. Ch. *Calyx* common, either many-leaved, or divided into many segments. *Cor.* Florets in the disk numerous, hermaphrodite; tubular, four-lobed, unequal, in the circumferences, females either forming a ray, or more frequently little conspicuous. *Stam.* Filaments in the hermaphrodites four; anthers united in a hollow cylinder, the length of the floret. *Pist.* Germ inversely egg-shaped; style filiform; stigmas two. *Peric.* the permanent common calyx. *Seeds* differing in form; those of the disk ovate-triangular, the interior or angle obscure; those of the circumference larger, emarginate, flattish on one side, gibbous on the other, generally crowned with a border. *Receptacle* generally naked.

Eff. Ch. Florets of the disk four-lobed. Seeds differing in form.

* Without a ray.

Sp. 1. *C. filifolia*. Willd. 1. Thunb. Prod. 161. "Leaves half-sheathing, filiform." *Root* annual. A native of the Cape of Good Hope. 2. *C. anthemoides*. Linn. Sp. Pl. 1. Mart. 1. Lam. Enc. 1. Illust. Pl. 700. fig. 3. Willd. 1. (Ananthocyclus chamaemeli folio; Vaill. Act. Par. 1719. p. 381. Dill. Elt. 26. tab. 23. fig. 25. Chrysanthemum foliis coronopi; Pluk. Alm. 101. tab. 274. fig. 6. Tanacetum humile; Forsk. Ægypt. 148.) "Flowers pinnate-multifid, dilated." β . *Artemisia nilotica*. Linn. Sp. Pl. p. 1188. So nearly allied to this species that it may be doubted to which genus it properly belongs. *Root* annual, stem from three to five inches high, first erect, then procumbent, tender, pubescent; branches alternate incurved, spreading. *Leaves* alternate, sessile, green, smooth; segments distant, toothed, or entire. *Flowers* yellow, drooping; peduncles solitary, filiform, one-flowered; calyx-leaves in two or three ranks, oblong, obtuse, with a white membranous edge; florets of the circumference without a corolla, consisting of naked pistils concealed within the calyx. *Receptacle* naked. A native of Spain, and the island of St. Helena. β . of Ægypt. 3. *C. aurea*. Linn. Sp. 4. Mart. 2. Lam. 2. Willd. 2. Loeb. It. 163. 221. Fl. Arrag. 124. "Leaves

pinnate-fetaceous, multifid; flowers drooping." *Root* annual. *Stem* partly procumbent. *Flowers* yellow. *Receptacle* naked. A native of the south of Europe. It has a pleasant aromatic smell. 4. *C. coronopifolia*. Linn. Sp. 3. Mart. 4. Lam. Encyc. 3. Ill. Pl. 700. fig. 1. Willd. S. Gært. tab. 165. fig. 10. Flor. Dan. tab. 341. (Ananthocyclus coronopi folio; Vaill. Act. 1719. Dill. Elt. 27. tab. 23. fig. 26. Chrysanthemum; Breyn. Cent. 156. tab. 7. fig. ult. Bellis; Moris. Hist. 3. 30. tab. 6.) "Leaves lanceolate-linear, embracing the stem, pinnatifid-toothed; stem procumbent; branches one-flowered." Whole plant smooth. *Root* annual. *Stem* from four to six inches long, cylindrical, tender. *Leaves* alternate, shining, somewhat fleshy, embracing the stem with a complete sheath one or two lines long. *Flowers* sulphur-coloured; female florets pediceiled. *Receptacle* conical, depressed, tubercled, naked, radiate with the pedicels of the female florets and seeds. *Seeds* not crowned with a border. A native of Africa, but now said to be naturalized in East Frisland, near Embden. 5. *C. pubescens*. Willd. 4. Desf. Alt. 2. 284. "Stem prostrate; leaves pinnated, pubescent; peduncles filiform, naked, one-flowered; calyx-leaves scarious at the edge." *Root* annual. *Stems* several, smooth. *Leaves* with unequal, narrow, linear, acute pinnæ. *Flowers* the size of those of *C. anthemoides*; peduncles solitary. A native of cultivated fields in Barbary. 6. *C. pufilla*. Willd. 5. Thunb. Prod. 162. "Leaves pinnated, smooth; calyx-leaves egg-shaped, obtuse." A native of the Cape of Good Hope. 7. *C. nudicaulis*. Willd. 6. Thunb. 162. "Leaves pinnated, hairy; calyx-leaves egg-shaped, obtuse." A native of the Cape of Good Hope. 8. *C. abrotanifolia*. Willd. 7. (C. cretica montana; Tour. Cor. 37.) "Leaves pinnate, villous; pinnæ linear, quite entire or bifid; stem branched at the base. *Root* perennial, woody, branched. *Leaves* petioled. *Flowers* on long, terminal, one-flowered peduncles. A native of Crete. 9. *C. lifinnata*. Willd. 10. Thunb. Prod. 162. "Leaves sessile, bipinnated, smooth; stem smooth." *Root* annual. A native of the Cape of Good Hope. 10. *C. globifera*. Willd. 11. Thunb. Prod. 162. (C. pilulifera; Mart. 11. Lam. 7. Linn. jun. Supp. 378.) "Leaves bipinnated, smooth; stem pubescent." *Root* annual. *Stem* erect. *Flowers* globular. A native of the Cape of Good Hope. 11. *C. tanacetifolia*. Linn. Syst. Nat. 10. Mart. 9. Lam. Encyc. 4. Ill. Pl. 700. tab. 1. Willd. 12. (C. tripinnata; Thunb. Prod. 162. Tanacetum suffruticosum; Linn. Sp. Pl. p. 1183; Milletolum; Pluk. Mant. 130. Amalth. 147. tab. 430. fig. 7.) "Leaves thrice pinnated; the small segments acute, stem erect; flowers in corymbs." *Root* annual. *Stem* more than a foot high, herbaceous, not at all shrubby, firm, slightly angular, pubescent, much branched. *Leaves* glaucous, petioled. *Corymb* terminal, large, compound; female florets scarcely any. A native of the Cape of Good Hope. 12. *C. umbellata*. Linn. jun. Supp. 378. Mart. 5. Lam. 5. Willd. 14. "Leaves lanceolate, hirsute; stem erect; flowers in an umbel." *Stem* a foot and half high, cylindrical, hirsute. *Leaves* almost a finger's length, alternate, crowded, resembling those of protea. *Umbel* terminal, five-flowered; peduncles hirsute, furnished with alternate bracts; calyx-leaves somewhat imbricated, villous; inner ones awl-shaped, longer than the disk, smooth and coloured on the inside; flowers hemispherical. *Seeds* crowned with an obsolete border; receptacle naked. A native of the Cape of Good Hope. 13. *C. fericea*. Linn. jun. Supp. 377. Mart. 12. Lam. 6. Willd. 13. Thunb. 162. "Leaves thrice pinnated, silky-tomentous; pinnule linear." *Root* perennial. *Stems* herbaceous, simple, procumbent, short, tomentous, white.

Leaves petioled, white. *Flowers* yellow; petioles terminal, very long, solitary, naked; calyx hemispherical; scales nearly equal, obtuse, scarios, longer than the florets. A native of the Cape of Good Hope. 14. *C. quinquefida*. Willd. 15. Thunb. Prod. 161. "Leaves wedge shaped, quinquefid, hoary." A native of the Cape of Good Hope. 15. *C. minuta*. Mart. 14. Willd. 17. Forst. Prod. 301. "Leaves oblong-wedge-shaped, serrated, sessile; flowers sessile, opposite to the leaves." *Leaves* alternate, somewhat embracing the stem. *Flowers* solitary. A native of New Caledonia. 16. *C. pyrethrarua*. Linn. Mant. 116. Mart. 17. Willd. 21. "Leaves opposite, egg-shaped, crenate, petioled; peduncles one-flowered." *Stem* herbaceous. *Leaves* rather obtuse, slender. *Flowers* white; peduncles terminal, from the fork of the stem, longer than the leaves. *Receptacle* chaffy; chaff the length of the florets.

** With a ray.

17. *C. turbinata*. Linn. Sp. Pl. 6. Mart. 8. Lam. Enc. 8. (*C. africana*, calyce eleganti caelo; Tourn. 406. Cœna; Commel. Just. Vent. Lidbeckia; Willd. 3. Thunb. Prod. 161. Lancifia; Gært. Lam. Ill. Pl. 701. fig. 1. Chamæmelum æthiopicum lanuginosum; Brey. Cent. 148. tab. 73. Moris. Hist. 3. tab. 12. fig. 14.) "Leaves bipinnated, villos; receptacles top-shaped, with an empty space underneath." *Root* annual. *Stems* several, slender, clothed with white hairs, four or five inches long, a little branched, procumbent. *Leaves* alternate, finely divided. *Florets* of the disk yellow; of the ray very short, egg-shaped, white above, reddish underneath; peduncles two inches long, terminal; slender, naked; calyx-scales egg-shaped, small, nearly equal. A native of Africa. 18. *C. quinqueloba*. Linn. jun. Supp. 377. Mart. 6. Lam. Enc. 12. (Lidbeckia lobata; Willd. 1. Thunb. Prod. 161. Lancifia; Gært. Lam. Ill. Pl. 701. fig. 3.) "Stems erect; leaves five-lobed, somewhat tomentous." *Stems* rather erect, simple, somewhat pubescent. *Leaves* alternate, petioled, hoary underneath; lobes half-egg-shaped, nearly equal, mucronate. *Flowers* the size of those of matricaria; peduncles one or two, long, one-flowered, erect; bracts one or two, at a distance from the flower, lanceolate, small; calyx-scales equal. A native of the Cape of Good Hope. 19. *C. capensis*. Lam. Encyc. 9. (Matricaria capensis; Linn. Mant. 115. Willd. 3. M. africana; Berg. 296. Lancifia; Gært. Chamæmelum leucanthemum; Puk. Mant. 45. Seb. Mus. 1. tab. 16. fig. 2.) "Leaves pinnated, somewhat fleshy, tending to cylindrical; the lower ones sometimes bipinnated." In habit resembling matricaria chamomilla. *Root* annual. *Stems* six or seven inches long, numerous, much branched, diffuse. *Leaves* smooth, even-surfaced, slightly flattened at the midrib, edged with brown or purplish cylindrical teeth. *Florets* of the disk ten or twelve, yellow; of the ray white, ligulate, distant from each other, somewhat pedicelled, barren; peduncles terminal, rather long, striated, one-flowered; calyx scales imbricated, slightly scarios; receptacle half-egg-shaped. A native of the Cape of Good Hope. 20. *C. viscosa*. Linn. Sp. Pl. 5. Mart. 7. Lam. Encyc. 10. Willd. 9. (Lancifia; Gært.) "Leaves lyrate-pinnated." *Stems* seven or eight inches long, somewhat decumbent. *Leaves* pinnatifid striated, villos, viscid. *Florets* of the ray very short, white; receptacle naked, conical. A native of La Vera Cruz. 21. *C. stricta*. Linn. Mant. 287. Mart. 3. Lam. Enc. 11. (Lancifia; Gært. Lam. Ill. Pl. 701. fig. 2. Lidbeckia pectinata; Willd. 2. Thunb. Prod. 161. Berg. Cap. 306. tab. 5. fig. 9.) "Leaves pinnatifid, flat, naked, dotted; stem erect, stiff." *Root* perennial. Whole

plant glaucous. *Stems* nearly erect, weak, three feet high or more, almost smooth, most frequently simple. *Leaves* alternate, sessile, oblong, ciliated, soft; segments obtuse, with a small point. *Flowers* rather large, terminal, solitary; calyx scales in two ranks, lanceolate, acute, equal, slightly ciliated. A native of the Cape of Good Hope.

Obf. Pontedera and Adanson separated the radiate species from the rest, under the generic name lancifia, and have been followed by Gærtner; though he acknowledges that this is the only difference, and that lancifia is no other than cotula masked (larvata) with a ray. He recommends it, however, to future observers to examine whether the seeds in the other species have a different form in the disk and the ray, as he has actually found them in turbinata. La Marck, in the Encyclopedie, had retained all the species under cotula; but, in his subsequent illustrations he has adopted the new genus lancifia, and has figured three species. Willdenow has referred these plants to the lidbeckia of Bergius. But as the simple presence or absence of a ray does not appear to us sufficient to constitute a generic distinction, we have continued the original arrangement of Linnæus, only breaking the genus into two sections. Commerfon and Justicu have made a new genus for *C. turbinata*, with the following character. *Flowers* radiate; florets of the disk four-cleft; of the ray about twenty, ligulate, very short. *Calyx* top-shaped, with an empty space under the receptacle, and a short eight-cleft border. *Seeds* compressed. *Receptacle* convex. But there is nothing in it inconsistent with the generic character of cotula given above.

COTULA alba; Linn. See ECLIPTA erecta.

COTULA bicolor; Willd. See GRANGEA.

COTULA cretica minima; Tourn. See ANACYCLUS creticus.

COTULA cuneifolia; Willd. See GRANGEA.

COTULA grandis; Linn. See CHRYSANTHEMUM flos-culorum.

COTULA maderaspatana; Willd. See ARTEMISIA maderaspatana et grangea.

COTULA minima; Willd. See ARTEMISIA minima.

COTULA non fetida; J. Baul. See ANTHEMIS arvensis.

COTULA spilanthis; Linn. See SPILANTHUS urcus.

COTULA verbesina; Linn. See LAYERIA decumbens.

COTURNICES, in Ornithology. See TETRAO.

COTURNIX, the Quail of English writers, and Caille of Buffon; a species of Tetrao, which see.

COTUY, in Geography, a canton and town in the Spanish part of the island of S. Domingo, bounded E. by the bay of Samana, N. by the chain of mountains called Monte-Christ, W. by the territory of la Vega, and S. by the chain of mountains, called Sévico. In the year 1505 gold mines were worked here. In the mountain of Meymm, whence issues a river of the same name, there is a copper-mine so rich, that when the copper is refined it will yield eight per cent. of gold. Here are also found excellent lapis-lazuli, a streaked chalk, preferred by some painters to bole, loadstone, emeralds, and iron of the best quality. The soil is excellent, and the plantains are highly commended. The people cultivate tobacco, but are chiefly employed in herding swine. The town is seated but a league from the S.W. bank of the Yuna, which becomes navigable near this place, about 13 leagues from its mouth in the bay of Samana. It contains about 160 scattered houses, in the middle of a little Savannah, and surrounded with woods; 30 leagues N.E. of St. Domingo, and 15 S.E. of St. Yago. N. lat. 19° 11'. W. long. 70° 7'.

COTUZA, in Ancient Geography, Al-Aleab, a town of Africa,

Africa, which was situated on the brow of a hill between Hippo-Zaritus and Ruscinona. This was the most northerly town of Zeugitania.

COTYÆUM, a town of Asia Minor, in the Greater Purygia, according to Strabo, Ptolemy, and Pliny.

COTYALJUM, a town of Asia, towards Pamphylia.

COTYLA, or COTULA, a liquid measure in use among the ancients, equal to the Roman semi-fextary.

Savot adds, that the Roman cotyla contained twelve ounces of any liquor: upon which principle there must have been as many cotylæ as there were liquors ordinarily sold; which is nothing strange, since, in several countries, we still find measures of different capacity, called by the same name, when they contain the same weights, though under different bulks.

Fannius says, the cotyla was the same thing with the hemina, which was half a fextary.

"At cotylas, quas, si placeat, dixisse l'cebit
Heminas, recipit geminas fextarius unus."

Chorier observes, that the cotyla was used as a dry measure, as well as a liquid one; from the authority of Thucydides, who in one place mentions two cotylæ of wine, and in another two cotylæ of bread.

COTYLE, or COTYLOID CAVITY, in Anatomy, from *κοτυλη*, a cup, or measure, is the deep excavation in the os innominatum, which receives the head of the thigh bone. See SKELETON.

COTYLEDON, in Botany, (*κοτυληδων*; Diosc.: the same as *κοτυλη*, a cavity; so called because the leaves of some species are hollowed into a kind of basin.) Linn. Gen. 578. Schreb. 788. Willd. 912. Juss. 207. Vent. 3. 275. Class and order, *decandria pentagynia*. Nat. Ord. *Succulentæ*, Linn. Vent. *Sempervivæ*, Juss.

Gen. Ch. Cal. Perianth one-leaved, short, with four or five segments or teeth. Cor. monopetalous, campanulate or funnel-shaped, four or five cleft. Stam. Filaments eight or ten, almost the length of the corolla, attached to its tube; anthers erect. Pist. Germs four or five, each of them with four or five nectareous scales at the outside of the base; styles the length of the stamens; stigmas simple, curved outwards. Peric. Capsules four or five, oblong, inflated, acute, one celled, one-valved, opening longitudinally at the inner side. Seeds numerous, small.

Ess. Ch. Corolla monopetalous, with four or five nectareous scales at the base of the germ. Capsules four or five.

* Flowers five-cleft.

Sp. 1. *C. orbiculata*. Linn. 1. Mart. 1. Lam. 1. Willd. 1. "Leaves orbiculate, fleshy, flat, quite entire; stem shrubby." Linn. "Leaves ovate-spatulate, obtuse with a point, even-surfaced; flowers panicled." Hort. Kew. *α*. "Leaves ovate-spatulate; stem erect." Hort. Kew. Herm. Lugdb. 349. tab. 341. Moris. Hist. 3. 474. tab. 7. fig. 39. *β*. "Leaves oblong-spatulate; stem erect." Hort. Kew. *γ*. "Leaves ovate-spatulate; stem much branched, and divaricate. Hort. Kew. (*C. paniculata*? Willd. 2. Linn. Supp. 242. Thunb. Prod. 83. "Shrubby; leaves oblong-egg-shaped, sessile; panicle divaricated, branched.") *δ*. "Leaves orbiculate-spatulate; stem erect." Hort. Kew. Bot. Mag. 321. Root perennial. Stem two or three feet high, often shrubby, branched, with a whitish bark. Leaves opposite, fleshy, glaucous, purple at the edges. Flowers campanulate, reddish; scape a foot long, branched at its extremity. A native of the Cape of Good Hope. 2. *C. fascicularis*. Willd. 3.

Mart. 16. Hort. Kew. 2. p. 106. Burm. Afr. 41. tab. 18. "Leaves wedge-shaped, fascicled, terminal; stem thickened; branches fleshy, somewhat conical." Root perennial. Leaves green. Flowers drooping, reflexed. A native of the Cape of Good Hope. 3. *C. cuneata*. Willd. 4. Thunb. Prod. 83. "Leaves wedge-shaped, fleshy, hairy; flowers panicled, hirsute." Root perennial. A native of the Cape of Good Hope. 4. *C. sempervivum*. Non biberstein; Annals of Botany, 2. 444. "Leaves in globular fascicles, wedge-shaped, entire, ciliate-scaly at the edges; scapes radical; panicle oblong, loose." Root perennial, throwing out globes of leaves in the manner of a *sempervivum*. Leaves numerous, densely imbricated, broad and short, fleshy, scarcely pubescent. Scape quite simple, about seven inches long, slender, semi-cylindrical, pubescent. Panicle terminal, oblong; peduncles alternate, short, two or three-flowered, villous-viscid; bractes minute, lanceolate, rather obtuse; calyx villous-viscid; segments lanceolate, the length of the tube of the corolla; corolla similar in colour to *sedum telephium*, a little larger; tube adpressed to the germs; border rather erect, with oblong acute segments; anthers small, globular-didymous, purple; stigma very small. A native of the higher mountains in Georgia, between the Terek and the Kur. 5. *C. spuria*. Linn. Sp. Pl. 2. Mart. 2. Willd. 5. (*C. africana frutescens, folio longo et angusto, flore flavescente*; Comm. Rar. 23. tab. 23. Burm. Afr. 43. tab. 19. fig. 1. and tab. 22. fig. 1. *Sedum africanum, flore hemerocallidis*; Moris. Hist. 3. 474. tab. 7. fig. 40.) "Leaves spatulate-lanceolate, fleshy, quite entire; stem shrubby." Linn. "Leaves spatulate, obtuse with a point, naked." Hort. Kew. Stem very thick, with obtuse branches, leafy only at the end. Leaves naturally opposite, (in monstrous plants, alternate,) petioled. Scape terminal, a foot high, somewhat umbelled, divaricated. Flowers drooping, yellowish; border revolute, sprinkled within with minute red spots; stamens a little longer than the tube; anthers red. Linn. Mant. Obs. La Marck supposes that Linnæus, under this name, has confined two different plants, which he thus distinguishes. 1. *C. teretifolia*. *C. africana, flore pulcherrimo*; Tourn. 50. Motif. Hist. tab. 7. fig. 40. Pluk. tab. 223. fig. 1. Burm. Afr. tab. 19. fig. 1. Pet. Gaz. tab. 89. fig. 2. "Leaves almost cylindrical, fleshy, obtuse, narrowed at the base; stem thick, shrubby." Stem scarcely a foot high, a little branched. Leaves the length and thickness of a finger, without a coloured border. Scape terminal, a foot long, branched into a corymb. Flowers very handsome, reddish within, drooping; border reflexed. A native of Africa, in rocky and sandy places near the sea. This, we apprehend, should retain the Linnæan name. 2. *C. unguata*. Burm. Afr. 54. tab. 22. fig. 1. "Leaves oblong, fleshy, semi-cylindrical, channelled, with a callous purple border near the tip." Stem fleshy, shrubby, about a foot long, and the thickness of a finger, marked with the scars of fallen leaves. Leaves opposite, a finger's length, channelled on the inner side, convex on the back, greenish. Flowers red, drooping. 6. *C. purpurea*. Willd. 6. Thunb. Prod. 83. "Leaves linear-oblong, fleshy, smooth; flowers panicled." Root perennial. A native of the Cape of Good Hope. 7. *C. verticillata*. Willd. 7. Thunb. 83. "Leaves fleshy, nearly cylindrical, hirsute; flowers panicled; stem hirsute." Root perennial. A native of the Cape of Good Hope. 8. *C. cacaloides*. Mart. 11. Willd. 8. Linn. jun. Supp. Thunb. 83. "Leaves cylindrical; flowers panicled, stem shrubby." Perennial. Flowers yellow. A native of the Cape of Good Hope. 9. *C. reticulata*. Linn. jun. Supp. 242. Mart. 12. Willd. 9. "Leaves cylindrical; flowers reticulate-panicled;

COTYLEDON.

stem shrubby." Perennial, with the habit of *statice reticulata*. A native of the Cape of Good Hope. 10. *C. papillaris*. Linn. jun. Supp. 242. Mart. 8. Willd. 10. "Leaves cylindrical-egg-shaped; flowers in corymbs." A native of the Cape of Good Hope. 11. *C. mamillaris*. Linn. jun. Supp. 242. Mart. 9. Willd. 11. "Leaves alternate, cylindrical-egg-shaped; flowers alternate, nearly sessile." A native of the Cape of Good Hope. 12. *C. tuberculosa*. Lam. 4. Burm. Afr. 45. tab. 20. fig. 1. "Stem thick, beset on all sides with semi-globular tubercles; leaves oblong, fleshy, scattered, acute; peduncles and calyxes scabrous." β . Burm. Afr. 51. tab. 21. fig. 1. *Root* perennial. *Stem* shrubby, fleshy, cinereous, six inches high or more. *Leaves* from the centre of the tubercle, two or three inches long, sessile, almost cylindrical, glaucous, erect, a little channelled on the inner side; scattered, on the trunk; alternate, on the flowering stem. *Flowers* large, erect, red. β . *Leaves* linear, alternate; flowers greenish, inflated. A native of Africa, cultivated at Paris. 13. *C. hemisphaerica*. Linn. Sp. Pl. 3. Mart. 4. Lam. 5. Willd. 12. Dill. Elth. 112. tab. 95. fig. 111. "Leaves semi-globular." Linn. "Leaves somewhat orbicular, dotted with scurf, convex underneath; flowers nearly sessile." Hort. Kew. *Root* perennial. *Stem* scarcely a foot high, fleshy, shrubby, curved and twisted, branched from the bottom. *Leaves* not an inch long, about a quarter of an inch broad, scattered or imperfectly opposite, convex on the lower surface, nearly flat on the upper. *Flowers* greenish, with purple tips, in a terminal spike. A native of Africa. 14. *C. triflora*. Linn. Supp. 242. Mart. 10. Willd. 13. Thunb. Prod. 85. "Leaves inversely egg-shaped, entire; flowers in a spike, nearly sessile, growing by threes." A native of the Cape of Good Hope. 15. *C. coccinea*. Willd. 14. Cavan. Ic. 2. 54. tab. 170. "Leaves inversely egg-shaped, acute, fleshy; spike leafy, terminal." *Flowers* sessile. Native country unknown. 16. *C. ferrata*. Linn. Sp. Pl. 4. Mart. 5. Lam. 6. Willd. 16. Dill. Elth. 113. tab. 95. fig. 112. (*Sedum creticum*, saxatile latifolium, flore purpurascente; Tourn. Cor. 19.) "Leaves oval, crenate; stem spik-d." *Root* biennial. *Stems* several, simple. *Leaves* scattered, rather thick, toothed or crenate. *Flowers* reddish, in an oblong terminal spike, two or three together on the same peduncle; corolla divided more than half way down. A native of Candia and Siberia. 17. *C. spinosa*. Linn. Sp. Pl. 5. Mart. 3. Lam. 7. Murray Comm. Gott. 1776. p. 33. tab. 5. (Crassula; Linn. Mant. 388. Willd. Gmel. Sib. 4. 173. tab. 67. fig. 2.) "Leaves oblong, spinous-mucronate; stem spik-d." *Root* perennial. *Stem* not more than a foot high, quite simple, leafy from the bottom, about a third of its length, erect, the other two thirds covered with flowers and curved in the form of an S, thick, angular, stiff. *Root-leaves* in a roundish tuft; stem ones irregularly disposed, very near together, glaucous, sprinkled with small reddish dots. *Flowers* whitish, sessile; in a long, compound, leafy or bracteate spike. A native of Siberia. 18. *C. malacophyllum*. Willd. 15. Pallas It. 3. App. 88. tab. O. fig. 1. "Leaves lanceolate, acute, fleshy; spike cylindrical, terminal, leafless." It has the habit of the preceding species. *Root* annual. A native of the mountains in Dauria. 19. *C. umbilicus*. Venus navelwort. Linn. Sp. Pl. 6. β . Mart. 6. β . Lam. 8. Willd. 17. Eng. Bot. 325. (*C. major*; Bauh. Pin. 285. Tourn. 90. *C. umbilicus veneris*; Clus. Hist. 2. 68. *C. vera radice tuberosa*; Rai. Syn. 271. *Sedum luteum*, folio umbilicato; Morif. Hist. 3. 470. § 12. tab. 10. fig. 4.) "Leaves peltate, crenate; stem spik-d, nearly simple; flowers drooping; bractes entire; root tuberous." *Root* perennial.

Whole plant succulent, fragile, even-surfaced, pale-green. *Stem* from seven to ten inches high, erect, cylindrical, smooth, leafy, and sometimes with flowering branches from the base. *Root-leaves* numerous, on long petioles, roundish, generally umbilicate, concave, crenulate, smooth, fleshy, withering as the stem advances. *Stem-leaves* petioled; lower ones umbilicate-peltate, crenate-repand; upper ones smaller, scarcely peltate, toothed-crenate; bractes lanceolate, entire. *Flowers* yellowish, clustered, tubular; border slightly divided into five short, mucronate, concave segments; stamens very short, inserted in the mouth of the tube. A native of various parts of Europe; abundant in Wales, and some of the western counties of England. 20. *C. lutea*. Huds. Flor. Ang. p. 194. Willd. 18. Eng. Bot. 1522. (*C. umbilicus* α ; Linn. Sp. Pl. Mart. *C. lusitanica*; Lam. 9. Ill. Pl. 389. fig. 2. *C. radice tuberosa* longa repente; Morif. Prælect. 257. Tourn. 9c. Dodart Rem. 265. tab. 73. *Sedum luteum*, radice repente majus; Morif. Hist. 3. 471.) "Leaves crenate-toothed; the lowest somewhat peltate; stem spik-d, nearly simple; flowers erect; bractes toothed; root creeping." *Root* perennial, fleshy, branched. *Stem* a foot high, erect, reddish. *Root-leaves* a little larger than those of the preceding species, scarcely umbilicate. *Stem-leaves* alternate, roundish oval, on short petioles. *Flowers* on short peduncles, in a dense, cylindrical, upright spike, bright yellow, divided nearly half way down; segments lanceolate, acute. A native of Portugal; and supposed by Hudson to be indigenous in England, but, we think, on questionable authority. He himself saw a plant in a garden, sent from Somersetshire. His friend, Tofted, also informed him, that it grows wild on walls and in rocky ground, in the West Riding of Yorkshire; but, though well acquainted with that part of the country, we have not had the good fortune to meet with it, nor has it been found by any other English botanist. 21. *C. hispanica*. Linn. Sp. Flan. 8. Mart. 7. Lam. 10. Willd. 23. Loess. It. tab. 1. (*C. africana*, sedi folio; Tourn. 90. *C. palustris*, floribus rubris longioribus. β . brevioribus; Shaw Afr. 177. 178.) "Leaves oblong, nearly cylindrical; flowers fascicled." *Root* biennial, fibrous. *Stem* simple, cylindrical, nearly erect, about five inches high. *Leaves* alternate, rather obtuse, sessile, somewhat hairy, flatish above, with dusky red dots. *Flowers* in a terminal corymb; calyx short, deeply divided; corolla funnel-shaped; tube an inch long, reddish on the outside, a little hairy; border purple, with flat acute segments. A native of Spain, the Levant, and the north of Africa. The herb has the habit of *sedum album*. 22. *C. viscosa*. Mart. 17. Willd. 24. Vahl. Symb. 2. 51. (*C. hispida*; Lam. 11. *C. mucizonia*; Orteg. Monogr. Madrit. 1772, with a figure. Jacq. Collec. Supp. 112. tab. 12. fig. 2.) "Leaves cylindrical; racemes terminal, villous-viscid; stem branched." *Root* annual. *Stem* four or five inches high, slender, weak, cylindrical, purplish towards the bottom, hispid. *Leaves* alternate, sessile, fleshy, glaucous green, generally smooth, obtuse, three or four lines long, resembling those of *sedum album*, but thicker. *Flowers* small, campanulate, white, with reddish streaks on the outside, erect, in a terminal corymb; peduncles one-flowered; segments of the calyx expanding, oblong, flattened on the inside, convex without, hispid; corolla only three lines long; lobes of the border obtuse, expanding; stamens a little shorter than the corolla; anthers yellow. A native of Spain.

** *Flowers four-lobed.*

23. *C. pinnata*. Lam. 12. "Leaves quinate-pinnated; leaflets inversely egg-shaped; crenatures filament-bearded; flowers

flowers

flowers long, drooping. β . crenatures not bearded." A beautiful evergreen plant, about four feet high. *Stem* about the thickness of a finger, quadrangular, marked with purple lines and dots. *Leaves* opposite; upper ones simple, lanceolate, entire. *Flowers* yellow, tubular, an inch and half long, octandrous, in a large terminal panicle; four of the stamens a little longer than the others. Discovered in the Isle of France by Soumerat. 24. *C. laciniata*. Linn. Sp. Pl. 7. Mart. 14. Lam. 13. Willd. 20. (*C. afrum*, folio laciniato; Boerh. Lugdb. 1. 288. tab. 288. *Telephium africanum angustiori folio*; Pook. Alm. 362. tab. 228. fig. 2. *T. sempervivum*; Petiv. Gaz. tab. 95. n. 384. *Planta anatis*; Rumph. Amb. 5. 275. tab. 95.) "Leaves lacinated; flowers nearly erect, narrowed at the neck." *Root* perennial. *Stem* a foot and half, or two feet high, cylindrical, succulent. *Leaves* opposite, fleshy, lacinated, or deeply pinnatifid, with lanceolate toothed segments; upper or bracteal ones entire, linear-lanceolate. *Flowers* yellow, much smaller than those of the preceding species, in a terminal panicle; calyx divided almost to the base into lanceolate segments; lobes of the corolla oval, expanding; stamens eight; four larger, with their anthers at the orifice of the tube of the corolla. A native of the East Indies. 25. *C. lanceolata*. Mart. 18. Willd. 19. Vahl. Symb. 2. 51. Forsk. desc. 89. "Leaves lanceolate, serrated towards the tip; panicle villous." Similar to the preceding in habit, inflorescence, and the form and colour of the corolla; but differing in the form of the leaves, and in having the stem, peduncles, calyxes, and corollas villous. A native of Arabia. 26. *C. alternans*. Mart. 19. Willd. 21. Vahl. Symb. 2. 51. (*C. orbiculata*; Forsk. cat. arab. 112.) "Leaves orbicular-spatulate, quite entire; flowers paniced, smooth." Whole plant smooth. Partial peduncles alternate, not opposite. Corolla resembling that of *C. laciniata*, with reddish-yellow lanceolate segments. A native of Arabia. 27. *C. nudicaulis*. Mart. 15. Willd. 22. Vahl. Symb. 2. 51. (*C. Ægyptiaca*; Lam. 14. *C. integra*; Medic. Comm. palat. 3. 200. tab. 9. *C. deficiens*; Forsk. desc. 89.) "Leaves roundish, concave, obsoletely crenated; flowers erect, in a paniced cyme." *Root* perennial. *Stems* a foot and half high, cylindrical, ascending. *Leaves* opposite, fleshy, pale green; lower ones roundish, concave, entire, somewhat petioled; those on the middle of the stem egg-shaped, and slightly crenated; upper ones small, a little spatulate. *Flowers* with a reddish border, pale on the outside, sometimes five-cleft; calyx divided to the base. A native of Egypt.

Propagation and Culture.—The African and East Indian kinds are propagated by planting cuttings in any of the summer months, which should be previously placed in a dry place for a fortnight or three weeks, that the wounded part may heal, and the redundant sap evaporate. They thrive best in a compost consisting of one-third of fresh light earth from a pasture, one-third of sand, and the other third of lime-rubbish and rotten tan in equal quantities; these should be well mixed, laid in a heap six or eight months, turned over five or six times, and finally passed through a screen. The cuttings should be planted separately in small pots, set for about a week in a warm shady place, and then plunged into a moderate hot-bed of tanners' bark, where they should be shaded from the sun, and allowed fresh air as often as the weather will permit. In about six weeks, or two months, they should be gradually hardened by drawing the pots out of the tan; a week after, they may be removed into the green-house, and after another week exposed to the open air, in a well-shel-

tered situation, where they may remain till the beginning of October; being allowed only so much water as is necessary to keep their leaves from shrinking. They are best kept during winter in an open, airy, dry glass case, among mesembryanthemums and other tender succulent plants, where they may enjoy as much sunshine as possible; for if kept in a common green-house among shrubby plants, they are apt to imbibe too much moisture, often cast their leaves, and sometimes entirely perish. *C. laciniata* requires a moderate stove in winter, and will not bear the open air in our climate during any part of the year. The hardy European species thrive best when sown upon a wall, or among rock work, similar to their natural situation.

COTYLEDON africana frutescens foliis aspinis angustis; Mart. See *CRASSULA scabra*.

COTYLEDON africana frutescens flore carneo amplo; Breyh. See *CRASSULA coccinea*.

COTYLEDON africana frutescens flore umbellato coccineo; Comm. Brndl. See *CRASSULA coccinea*.

COTYLEDON altera matthioli; J. Bauh. See *SAXIFRAGA cuneifolia*.

COTYLEDON altera montana; Clus. See *SEMPERVIVUM hirtum*.

COTYLEDON aquatica; Lob. See *HYDROCOTYLE vulgaris*.

COTYLEDON aquatica; Sloan. See *HYDROCOTYLE umbellata*.

COTYLEDON aut fedi species; Gesn. See *SAXIFRAGA cuneifolia*.

COTYLEDON flore luteo media; Herm. See *CRASSULA alternifolia*.

COTYLEDON media et minor foliis ferratis; C. Bauh. See *SAXIFRAGA cotyledon*.

COTYLEDON palustris; Dod. See *HYDROCOTYLE vulgaris*.

COTYLEDON stellata; C. Bauh. See *SEDUM stellatum*.

COTYLEDONES, the cotyledons, or seed-lobes, are a pair of roundish or compressed bodies, constituting the chief bulk of most seeds, and immediately attached to the embryo. See *CORCULUM*. They commonly rise out of the ground, with the *plumula*, as soon as the young root has established itself, and assume the appearance and office of leaves, till the real foliage comes forth. Afterwards, sooner or later, the cotyledons wither and fall off. Their original figure differs widely in different tribes of plants, and much more their form and appearance in a leafy state, when, moreover, they usually bear no resemblance to the real leaves of the species or genus to which they belong. In the lupine they are orbicular; smooth and convex below; rugged on the upper-side: in the radish inversely heart-shaped: in umbelliferous plants long and lanceolate: being in all these examples remarkably different in shape, texture and surface from the leaves of each. The same parts in the pea, bean, or vetch family, frequently remain under ground but little altered, the *plumula* being sent up naked to become the stem and leaves of the plant. The same thing takes place in the horse-chestnut, nasturtium, and *Cyanus Nelumbo*. We presume such subterraneous cotyledons are destined to perform the usual functions of those organs with respect to air, but not to light, for being never exposed to the latter, they never acquire that green colour proper to leaves, which is owing to its action, and which ascending cotyledons do assume. We speak of these bodies in the plural, because we doubt very much whether any plant can be said to have a solitary cotyledon, unless we understand

derland as such the *vitellus* of Gærtner, which is mostly simple; if so, the latter term becomes superfluous. Some few plants are acknowledged to have more than two cotyledons, as the fir genus, *Pinus*, and its allies; mosses also, hitherto reported to have but one, are now shewn by Hedwig to have numerous, as well as compound cotyledons.

The organs in question are not in all cases confined to the functions of leaves. They are frequently the repository of farinaceous matter, destined to be absorbed into the embryo for its nourishment, till the root can furnish due supplies. This is evinced by a sweet taste perceptible in the cotyledons of many seeds as they begin to germinate. Dr. Darwin supposes, with great probability, that melon and cucumber seeds, if kept long before they be sown, grow less luxuriantly in their herbage, owing to this nutritious farina being partly spoiled by keeping. The fact is well known to gardeners, who purposely preserve such seeds for some years, that the plants may prove more compact and manageable, as well as more abundant in fructification. In many plants this nutritious farina forms a distinct body or organ by itself, denominated by Gærtner *albumen*, which term not having been explained, in this sense, in the former part of this work, we shall mention it here. The bulk of the seed in wheat, barley, and all the natural order of grasses to which they belong, as well as in palms, and many other plants, is made up of the *albumen*, or white, a substance of a farinaceous, horny, or even stony texture. This never rises out of the ground, but becomes soft and even milky, acquiring more or less of a sweet taste, as soon as the process of germination begins. The operation of malting is well known to consist in first promoting this process by moisture, and then stopping it by such a degree of heat as destroys the vital principle, by which means the sweet *albumen* is obtained for use. See MALT. Plants thus circumstanced have been named *monocotyledones*, or furnished with a single cotyledon; those with two being called *dicotyledones*, and those with more than two *polycotyledones*. It seems, however, that the first have scarcely any cotyledon at all, grasses and corn indeed having a scale only, very diminutive and inconspicuous, situated between their *albumen* and *embryo*, which is the *vitellus* of Gærtner, a part he supposes to contribute to the nourishment of the seed. Such an opinion, however, is scarcely tenable, when we reflect how amply food is supplied by the *albumen*. The writer of the present article therefore has first presumed the *vitellus*, in whatever form it presents itself to our notice, to be analogous to a cotyledon, so far as air only is concerned; and he further presumes that many tribes of plants, guessed by writers of botanical systems to be monocotyledonous, and as such making a primary division in their classification, are in fact acotyledonous; even grasses scarcely deserving, on account of the slight scale or rudiment of a *vitellus* above-mentioned, to be esteemed monocotyledonous, and certainly not so to be denominated from the simple form of their *albumen*, according to the hitherto received idea. But whatever may be determined with respect to grasses, it is allowed that palms and lilies have not even the rudiment of a *vitellus*, much less any acknowledged cotyledon. Yet these two families have such an affinity to grasses, that future writers on natural orders must, somehow or other, square their definitions so as to arrange them near together; while mosses, in many points more nearly related to them than to any other plants, must, if the cotyledons are to regulate us, be sent far away. We mean by these suggestions, merely to collect facts; well aware that a natural system of arrange-

ment, the great *desideratum* in botanical philosophy, is only to be brought in any degree towards perfection by the labour and attention of ages, and that nothing but disjointed materials can as yet be obtained towards the intended edifice, whose plan is yet in embryo. We readily admit that the parts of the seed, especially the cotyledons and *albumen*, promise the most stable foundation of this edifice; but they must be applied in a different manner to this purpose from what they have hitherto been. We are happy to see that the great leader in this department of botanical arrangement, Jussieu, is laudably desirous to profit of, and to pursue, the remarks and discoveries of his eminent fellow-labourer Gærtner. By the co-operation of such minds, science is really advanced, and such only can lend any beneficial assistance to so deep a subject. S.

COTYLEDONOIDES; Bradl. See CRASSULA *tetragona*.

COTYLISCUS, or COTYLUS, in *Antiquity*, a vessel with a narrow mouth, a very wide belly, and only one handle.

COTYLIUM, in *Ancient Geography*, a strong place of Asia Minor, in Phrygia.

COTYLIIUS, a mountain of the Peloponnesus, in Arcadia. Pausanias says, that it was situated at the distance of 40 stadia from the town of Phigalia.

COTYLON, a place of the Peloponnesus in Arcadia, upon mount Cotylus, and above the temple of Apollo. Pausanias says that it had a temple of Venus with her statue, and that in his time it was not covered.

COTYLUS, a hill of Asia Minor, in Phrygia, according to Strabo; who says, that it formed a part of mount Ida, and that the Scamander, the Granicus, and the *Æsepus* issued from it.

COTYNES, a town of Italy, possessed by the Aborigenes, and taken by the Sabines.

COTYORA, a Greek town and colony, situated on the coast of the Euxine sea in the country of the Tibarenians. It is said to have been founded by the inhabitants of Sinope, and that it was their emporium or mart of commerce.

COTYRGA, a town situated in the interior of Sicily. Ptolemy.

COTYTTIA, or COTYTTIS, in *Antiquity*, a nocturnal festival, in honour of *Cotys*, or *Cotyta*, the goddess of wantonness. It passed from Thrace to Athens, where it was introduced by Alcibiades. This feast was observed by the Athenians, Corinthians, Chians, Thracians, and others, and celebrated with rites suitable to such a goddess, who was delighted with nothing so much as lewdness and debauchery; and the priests practised all sorts of effeminacy and meretricious arts. Another festival of the same name was celebrated in Sicily, in which the worshippers carried boughs hung with cakes and fruit, which any person might pluck off and devour. This last is said to have been observed in memory of the rape of Proserpine, who is by some thought to be the same with Cotytta. The worship of this deity was transferred from Greece to Rome. The priests were named Bapta; which see.

COTZIANUM, in *Ancient Geography*, a town of Asia Minor, in Phrygia.

COTZIO, or COZZAT, in *Geography*, a town of Bosnia, on the river Dracia; 104 miles S.W. of Belgrade, and 108 S.E. of Banjaluka.

COVA, a town of Portugal, in the province of Beira; 3 leagues N. E. of Viseu.

COVA, in *Ornithology*, the name given by Buffon to the *Cuculus cristatus* of Gmelin.

COVALAM,

- COVALAM, in *Botany*. See *CRATÆVA marmelos*.

COUANG-YANG, in *Geography*, a town of Asia, in the kingdom of Corea; 40 miles S. E. of Koang-tcheou.

COUBLANDIA, in *Botany*. Lam. Encyc. Juss. 352. Aubl. Guian. 937. tab. 356. Class and order, *monadelphica polyandria*. Nat. Ord. *Leguminosæ*? Juss.

Gen. Ch. *Cal*. Perianth one leaved, four toothed, with a small scale at the base. *Cor.* monopetalous; tube oblong, attached to the lower part of the inside of the calyx; border with four small divisions. *Stam.* Filaments more than twenty-five, long, united at the base, attached to the bottom of the calyx; anthers yellow, egg-shaped. *Pist.* Germ superior, oblong; style the length of the stamens; stigma acute. *Peric.* Legume? elongated, terminated by a point, composed of roundish knots separated from each other by strongly marked partitions, not opening. *Seeds* solitary in each knot.

-Sp. *C. frutescens*. A shrub with the habit of a sophora. *Stem* five or six feet high, much branched near the top. *Leaves* alternate, winged; leaflets five, egg-shaped, acute, entire, green, petioled; stipules two, small, caducous. *Flowers* white, in axillary and terminal racemes. A native of Cayenne, where it is in flower and fruit almost the whole year.

COUCH, in *Gaming*. See BASSET.

COUCH, in *Heraldry* a term used to express a shield hanging downwards. The origin of this position is supposed to have been, that the persons who were to fight in the tournaments, from the time when proclamation was made, till the day of fighting, hung up their shields by one corner from the windows of the neighbouring houses, or on the trees or barriers of the ground; if the tournament was to take place in the fields. The horse combatants hung up their shields by the left corner, and the foot combatants by the right. Some heraldic writers express this position by the word *pendant*.

COUCH, in *Malting*. See WET couch.

COUCH, in *Painting*, denotes a lay, or impression of colour, whether in oil or water, wherewith the painter covers his canvas, wall, wainscot, or other matter to be painted.

The word is also used for a lay or impression on any thing, to make it more firm and consistent, or to screen it from the weather.

Paintings are covered with a couch of varnish; a canvas to be painted must first have two couches of size, before the colours be laid; two or three couches of white lead are laid on wood, before the couch of gold be applied: the leather gilders lay a couch of water and whites of eggs, on the leather, before they apply the gold or silver leaf.

The gold wire drawers also use the word couch for the gold or silver leaf wherewith they cover the mals to be gilded or silvered, before they draw it through the iron that is to give it its proper thickness.

The gilders use couch for the quantity of gold or silver leaves applied on the metals in gilding or silvering. Each couch of gold is but one leaf, or two at most, and each of silver three, to gild: if the gilding be hatched, there are required from eight to twelve couches; and only three or four, if it be without hatching. To silver there are required from four to ten couches, according to the beauty of the work.

Couch Grass, in *Agriculture*, the name of a plant of the weed kind, the (*triticum repens*.) which is well known to the farmer from the expence, labour, and trouble which it causes in many cases, in removing it from arable lands. It is the pest of these sorts of ground, in many situations, as

from its nature and habits of growth it cannot be extirpated without considerable difficulty. It has numerous long jointed or knotted creeping roots, which insinuate themselves in the soil in various directions, and which, after being broken by the plough or harrow, have the property of quickly producing new plants. The ordinary method of destroying it is, by laying the ground to fallow in a hot dry summer, and harrowing it frequently over well, to draw out the roots, every piece of which should then be collected and burnt, or otherwise destroyed. Where this work is carefully and effectually performed, the ground may be so well cleaned and freed from it in one summer, that the remaining roots will not be capable of doing any great injury to the ensuing crop; but the best way is probably to sow the land in which this weed prevails with the seeds of such plants as require a frequent application of the horse hoeing culture; or with such sorts as produce plants which are capable of keeping it from growing by their shade and great closeness of stems. The blade of this grass is said by some to be so rough, that the cattle will not feed upon it when green. Trench-ploughing is recommended by Mr. Young in the Annals of Agriculture, as a proper method to destroy couch grass; where he thinks that by one earthing given deeply with the skim-couiter plough, and after that a hoeing system on the surface, the couch may be converted to a manure.

It is observed by the author of the "General view of the Agriculture of the County of Salop," that this weed, which is there termed *scutch*, is every where common, to the great expence of the husbandman. And Mr. Rudge, in the Report of the County of Gloucester, finds it "a most troublesome and almost unconquerable weed on clay lands; on the light lands and loams, he thinks, it may be dragged out, and finished by hand-picking with tolerable ease, but that on the stiff soils, and particularly in the wet furrows, nothing but repeated ploughings and exposure to the sun, during the heat of summer, can check the increase of it: hence, after a wet summer, the vale lands, in that district are, he says, generally foul." And he recommends a crop of spring vetches, as well suited to smother and keep it down.

But it has been suggested by Dr. Withering, on the authority of Mr. Southwell, that though this weed is commonly said to be refused by cattle, "at Naples the roots are collected in large quantities and sold in the market to feed horses; they have a sweet taste, something approaching to that of liquorice; when dried and ground to meal, they have been made into bread in years of scarcity. Dogs eat the leaves to excite vomiting." And "horses eat them when young, but leave them when full grown." "Cows, sheep, and goats, also eat them." It is likewise supposed that from their detergent quality they may be beneficial in the diseased livers of animals; as cattle which have been found to have schirrous livers in the winter, soon get cured when turned out to graze in the spring.

But though this is supposed the most common sort of couch or *squitch* in garden grounds, Mr. Pitt considers the *squitch* of arable lands as consisting of several species of plants besides the above, as different kinds of Bent grasses, (the *agrostis alba*, and *stolonifera*.) the tall oat grass (*avena elatior*.) and the creeping sort grass (*holcus mollis*.) and probably of the roots of some other of the hardy perennial grasses. The spreading knotty creeping sorts of these several plants, "are, he says, sometimes so interwoven together, in the soil, in sand that has been under hard tillage and bad management, as to form a perfect matting, and to choke the plough," that "they abound most in light and mixed soils, not equally infesting strong clays." It is conceived, that not one-tenth part of the couch or squitch of arable land is produced by the
dog's

dog's grass, (*triticum repens*) it being chiefly formed by the agrostis family of plants, though the particular species have not yet been fully ascertained by the agricultural botanists. It has been referred by some to the *agrostis capilaris*, by others to the *agrostis alba*, while others contend that it is the *triticum repens*. On strong or cold wet lands, it is supposed that the creeping red stalked bent grass, and the creeping soft grass, the *agrostis sibirica*, and *holcus mollis*, are the common couch or squitch grasses, but that on the light gravelly soils in Staffordshire, the tall oat grass, (*avena elatior*) is a very common couch or squitch grass; the roots of which, it is remarked, "are composed of a bunch of balbs affording shelter to pernicious grubs, worms, and insects;" and that the plant is extremely difficult of extirpation, and highly injurious to the crop, especially in a season which is inclined to be wet.

It has been further suggested that the different plants noticed above, as constituting what is understood by farmers under the title of couch grass, though they are found to troublesome in lands under the state of tillage, are probably good meadow grasses, from their roots not being so liable to run and spread themselves there, as in such lands as are pulverized, loosened, and broken down by the operations of the plough.

In different districts the weed, or combination of weeds, which constitute the couch grass of the farmer, is known under different titles, as *scutch-grass*, *sqitch-grass*, *quitch-grass*, *knot-grass*, *dog-grass*; *scutch scutch*, &c.

Couch Grass-drag, an useful implement of the harrow kind, made use of in different districts, for the purpose of drawing out and extirpating couch grass in tillage lands when undergoing the process of summer fallowing, or in other circumstances. The tools of this description are considerably different in different instances, but the more simple the construction the better. It has been suggested as an improvement in them, to have them formed with a double row of teeth or tines, those of one row being put opposite the intervals of the other, by which means the tool is said to be rendered more effective.

A powerful implement of this sort is shewn in *Plate IX. of Agriculture*, where *fig. 6*, is a side view of it when ready for work; *a a*, wheels for conveying it, and regulating its depth in working, being ten inches in diameter, turning on their axles on the under end of upright shanks as in castors of beds. When to be removed from one field to another, the wheels are to be taken out and reversed, and the drag turned upside down; *b*, middle beam to which the horses are attached, *e, e, e, e, e*, the coulters fixed in the beam with nuts and screws, being made of iron, 13 inches long below beams, and one inch and half, by half an inch square, inclining forward, so as to form a sort of segment of a circle in order to raise the roots to the surface; *e*, handle for directing the drag, four feet three inches in length. *Fig. 7* is a horizontal view of it; in which *a, a, a*, shew the mortice holes that receive the shanks of the wheels; *b*, the middle beam six feet eight inches in length, and five by four inches square, having a coulters hole near *b*; *c, c*, two side beams six feet nine inches in length, and five by four inches square; each beam having five coulters, placed six inches distant from each other to the right and left, so as to drag every six inches, the holes for them being plated with iron on both sides; *d*, bar, three by one inch square, by which the middle part of the implement is bound together; *e*, iron bolt, by which the fore-parts of the side beams *c, c*, are fixed to the middle beam *b*; *f, f*, handles for guiding it; *g*, hind bar four inches square for bracing the three beams together, and receiving the shanks of hind wheels; *h*, is another bar three by one inch

square; between which bars, the handles are placed by square staples so as to put in and take out as may be necessary; *i, i*, hind wheels ten inches in diameter. *Fig. 8* is a front view of one of the coulters, the full length before bent to the proper form, being 18 inches below, part going into the beam.

This implement is the invention of the author of the "Treatise on Agriculture and Planting," who considers it of great utility in clearing land infested with weeds of the couch grasskind, as tearing them up to the surface without ploughing the ground, or breaking the roots, and as being capable of doing a large extent, as 15 acres in the course of a day, with two men and four horses. It is considered as the proper time for the use of this tool, when the couch grass, after the second ploughing, has been collected by the common harrow. It is recommended that the land should be first dragged both ways of the ridges, then harrowing it once or twice, and at the same time collecting the weeds as much as possible into rows, by the harrows, rolling and afterwards gathering the weeds into heaps by the rake again, in order to their being burnt. And where the ground is much infested with these weeds, to have recourse to cross dragging, afterwards harrowing, collecting, gathering, and burning as before; and in some cases to plough the land a third time; and where these weeds appear, to have recourse to the same means again, so as to rake the land once or twice before the fourth ploughing. In cases where the coulters gather much weed, they should be occasionally cleared, which may be done by one person lifting up the side of the drag, while another removes it from the coulters by means of one of the handles of the implement.

Couch Grass-rake, is a sort of implement of the rake kind constructed for the purpose of collecting and removing weeds of the couch-grass kind from land in the state of tillage. In the work mentioned in the preceding article an useful tool of this sort is described, by means of which and the drag already noticed, the labour and expence of clearing lands from such weeds may be considerably abridged and reduced.

Fig. 9 in *Plate IX. of Agriculture*, is a side view of the whole implement in its complete state; *a* is the land wheel, thirty-two inches in diameter, turning on an iron arm one inch and a quarter in diameter, fixed on the end of a wooden axle-tree *b*, in the manner of coaches; the nave of which is seven inches in diameter at the thickest part, and eight inches long; the fellyes two by three inches square, having the spokes in proportion; *b* a section of the wooden axle-tree, forty-eight inches in length, and five inches square; on the ends of which are two iron arms, on which the land wheels move; *c* is a side view of the right hand shaft, mortised into the axle-tree, where it is about three inches and a half square, being about eight feet in length; *d* is a section of the rake head four by three inches and a half square; *e* a side view of one of the teeth or tines of the rake, eighteen inches in length below the wood in which it is fixed, and one by three eighths of an inch square next the wood tapering towards the point; *f* the regulating wheel ten inches in diameter, capable of being set so as to adjust the tines to any depth; *g* side view of the right side handle, fixed to the rake head by staples, being three feet four inches long, and three by two inches in the square; *h* side view of the forked iron bar by which the rake head is fastened to the axle-tree by two bolts; *i* iron bolt or hook in form of L, on which the forked iron bar *h* is hung.

Fig. 10 exhibits a horizontal view of the tool; *a, a*, the land wheels; *b* the axle-tree four feet in length; *c, c*, shafts; *d*, the rake head, six feet six inches in length, in which are fixed 17 teeth, at four inches distance from the centre to the centre

tre of each other ; *f, f*, regulating wheels, fixed in the outer mortises of the rake head, being made fast by serews at the ends of it ; which presses on the flank of the wheel ; *g, g*, handles by which the rake is lifted up and cleaned ; *b, b*, forked iron bars hanging on hooks *i, i*, and fixed in the rake head ; *i, i*, iron hooks fixed in the axle-tree ; *k*, wooden bar four feet in length and four by two inches square, for bracing the shafts together ; *l, l*, two iron arms for bracing the shafts more perfectly, being made fast to the axle-tree and shafts by iron bolts ; *m, m*, two pins for fixing the wheels at any required depth. In conveying the implement from place to place, the rake head is raised upright and fastened to the brace *k*.

It is remarked that the best season for commencing the process of clearing land by this tool, is in the interval between the second and third stirrings or ploughings of the fallow. In the execution of the business the first thing to be effected is, the rendering the land fine by harrowing and rolling, when it should be left under the impression of the roller, that the surface may be even, and the clods forced down out of the way of the rake. After this it may be raked cross-ways of the ridges, and when the tool has collected as much of the weeds as it can hold in a perfect manner, the handles should be lifted up high enough by the person who directs it, to admit the weeds to drop off from the teeth ; and then proceeding again the rake be dropped just beyond the row of weeds which have been brought together ; repeating the same as often as the rake becomes full, till the whole is completed at the side of the field. Then in returning by the side of the raked part, the rake is emptied adjoining the first row ; by which means the weeds are left in straight rows lengthways of the lands. After the field has been finished in this manner, the different rows should be collected into heaps, forked over to lighten them, and then burnt. Or, probably, a better method is to incorporate them with lime in its caustic state, so as to convert them into manure, to be afterwards blended with vegetable mould or other earthy substances.

It has been hinted that this tool may in some cases be beneficially converted to the purpose of raking the hay in meadow lands into what are termed wind-rows, in order to their being made up into large cocks.

COUCHAKAR, in *Geography*, a town of Asiatic Turkey, on the road from Smyrna to Teocat.

COUCHA-HOTUN, a town of Asia, in the country of Thibet ; 90 leagues W.S.W. of Turfan.

COUCHAN, a town of Asia, in the kingdom of Corea ; 85 miles E.N.E. of Ning-ki-tao.

COUCHANT, an heraldic term to express an animal lying close to the ground, having the head erect in order to distinguish him from an animal *dormant*.

COUCHANT and *Levant*, in *Law*. See *LEVANT*.

COUCHE', JEAN, in *Biography*, a designer and engraver, born at Paris in 1759, was the pupil of the elder Aliamet. Couché has distinguished himself amongst his contemporaries, by a judicious choice of his subjects, and a considerable degree of merit in the execution of them. In 1786, he undertook to publish the celebrated Gallery of the Duke of Orleans, which came out in numbers, the pictures being engraved from the designs of Borel by himself and other eminent artists. The following prints, having no other name than his own, are supposed to be from the designs of Couché.

1. A pair. 1. L'Amour volage. 2. L'Amour quêteur.
2. Four plates. 1. Le chemin de Castell en Flandres.
2. Vieux Chateau près d'Ypres. 3. La Nourrice. 4. Les Baigneuses. Huber.

VOL. X.

COUCHED, in *French Heraldry*, *couché*, signified a chevron placed either to the dexter or sinister side of the escutcheon, with the point toward the centre.

COUCHER, or COURCHER, in our *Statutes*, is used for a factor, or one that continues in some place or country for traffic ; as formerly in Galceign, for the buying of wices. Anno 37 Edw. III. c. 16.

COUCHER is also used for the general book, in which any religious house or corporation register their particular acts. Anno 3 & 4 Edw. VI. c. 10.

COUCHES, in *Geography*, a small town of France, in the department of Saône and Loire. It is the chief place of a canton, and has 1277 inhabitants. The canton itself has sixteen communes and a territorial extent of 192 kilometres and a half, with a population of 9802 individuals.

COUCHETOU, a town of Asia, in the country of Thibet ; 9 leagues E.N.E. of Couché-hotun.

COU-CHI, a town of China, of the third rank, in the province of Honan ; 30 miles E.N.E. of Kouang.

COUCHING, in *Agriculture*, a term frequently made use of by the older writers on husbandry to signify the operation or process of clearing tillage lands from weeds of the couch-grass or other kinds. See *FALLOW*, and *FALLOWING of Land*.

COUCHING the *Cataract*, in *Surgery*, signifies the depression of it towards the bottom of the eye : this term seems to be derived from the French word *couchant*, lying down. (See the article *CATARACT*.)

In the article above referred to, the reader will find a detailed account of the different kinds of cataract, the circumstances under which an operation for its removal may be advised, and the modes of extracting it ; also a short description of the methods used by several foreign practitioners for the depression of the cataract. But, we purposely reserved some observations on this latter part of our subject for the present occasion ; and therefore shall now describe the modes of depressing which are followed by English surgeons, especially by a judicious and skilful surgeon of Leeds, who is a strong advocate for this operation, in preference to extraction. Mr. Ware, Mr. Wathen, Mr. Phipps, and most of our other oculists, have practised extraction rather than the depression. Mr. Pott, indeed, did not altogether adopt the fashion in this respect ; but the ideas of baron de Wenzel have so far prevailed in England, as almost to explode the depressing it from our practice. (Vide Mr. Ware's translation of M. de Wenzel's *Treatise on the Cataract*, sect. v ; and Mr. Hey's *Surgical Observations*, chap. ii.) Mr. Hey has very fairly and sensibly met all the objections of M. de Wenzel against this neglected operation, and gives a variety of interesting cases to illustrate his own practice : he is decidedly of opinion, that couching or depression is both easier and safer than the common mode of extraction.

When the crystalline humour of the eye becomes opaque, the central part seems always to be the first affected. From the centre the opacity extends in all directions towards the circumference, but rarely, if ever, reaches the circumference. For if that were the case, unless the capsule contained a transparent fluid surrounding the crystalline, a mere opacity of this humour would be sometimes attended with total blindness, which, Mr. Hey believes, never happens without some other morbid affection of the eye. The chary processes advance on all sides as far as the circumference of the crystalline ; therefore no rays of light can fall upon the retina without passing through the crystalline.

In the operation of couching, the crystalline can only

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be moved into some part of the vitreous humour, different from that in which it is naturally situated, unless it is brought into the anterior chamber. It cannot be lodged *beneath* the vitreous humour, as a valuable modern author speaks; for that humour is every where in contact with the retina, and fills up the cavity formed by the coats of the eye.

The length of Mr. Hey's needle is somewhat less than an inch. It would be sufficiently long if it did not exceed seven-eighths of an inch. It is round, except near the point, where it is made flat by grinding two opposite sides. The flat part is ground gradually thinner to the extremity of the needle, which is semicircular, and ought to be made as sharp as a lancet. The flat part extends in length about an eighth of an inch, and its sides are parallel. From the place where the needle ceases to be flat, its diameter gradually increases towards the handle. The flat part is one-fortieth of an inch in diameter. The part which is nearest the handle is one-twentieth of an inch. The handle, which is three inches and a half in length, is made of light wood stained black. It is octagonal, and has a little ivory inlaid in the two sides which correspond with the edges of the needle.

The needle, made conformably to his directions, will pass through the sclerotic with ease. It will depress a firm cataract readily, and break down the texture of one that is soft. If the operator finds it of use to bring the point of the needle into the anterior chamber of the eye (which is often the case) he may do this with the greatest safety, for the edges of the needle will not wound the iris. In short, if the operator, in the use of this needle, does but attend properly to the motions of its point, he will do no unavoidable injury to the eye; and this caution becomes the less embarrassing, as the point does not project beyond that part of the needle by which the depression is made, the extreme part of the needle being used for this purpose.

We have no certain criteria by which it can be known, previously to an operation, whether a cataract is soft or hard. Those proposed for consideration by Mr. Pott are not to be relied upon. When a cataract is complicated with a complete amaurosis, or a total opacity of the cornea, the removal of the diseased crystalline must be fruitless. But in partial affections of the eyes from these complaints, a patient may receive such a degree of sight from an operation as yields much comfort, though it falls short of distinct vision. An universal adhesion of the iris to the capsule of the crystalline argues such a morbid state of the eye, that an operation cannot be undertaken without considerable doubt respecting the event, though the operation is not rendered hereby wholly improper. In this case, the iris shews no motion upon a sudden exposure to light, the pupil usually remains contracted, and is often irregular in its form. The operation has been done with success, where the adhesion was partial, by proceeding with great caution. In this case the pupil is contracted and dilated, by varying the degree of light thrown upon the eye. Sometimes when the pupil is circular in a strong light, it will, as being dilated in an obscure light, assume an irregular form, and thereby point out the situation and extent of the adhesion.

Though it would be improper to perform the operation of couching when the eye is in a state of inflammation, yet persons affected with a lippitude (see article LIPPITUDE) bear the operation much better than one would expect from the appearance of the eyes in that disease. Mr. Hey has never rejected a patient on this account, but has repeatedly performed it with success, and with very little subsequent inflammation, when numerous vessels of the conjunctiva were

turgid with blood, and the eyelids thickened, provided this state of the organ was habitual.

The author does not recommend an operation, if the disease is confined to one eye, while the sight of the other eye remains perfect. Nor is he hasty in recommending the operation in cases of cataract from external injury, as blows, or punctures of the cornea; having been led from experience to form the same opinion of the disease, when originating under such circumstances, which the late Mr. Pott entertained.

When the cataract is *congenital*, the eyes have often an irregular motion, as if the patient was looking at two distinct objects at the same time. The operation is rather more difficult in such patients, on account of the unsteadiness of their eyes; but it may be performed with safety, when the patient is so far advanced in years as to understand the design of the operation, and has been taught to desire it.

The habit of persons afflicted with cataracts is so different, that no general rule can be laid down respecting the manner of preparing a patient for the operation. In some cases, the loss of a little blood may with propriety be added to laxatives, and a strict regimen. In other cases, there may be such constitutional debility as to forbid any evacuation: and, in general, patients need only abstain from animal food and fermented liquors a few days previous to the operation, or a dose or two of any gentle purgative may be given.

Before we describe Mr. Hey's mode of operating, we submit to the reader Mr. Pott's answer to some objections which have been raised against couching.

The objections made against the operation of couching, at least those which have an apparent plausibility, Mr. Pott observes, are reducible to four:

1. That if the cataract be perfectly soft, the operation will not be successful, from the impossibility of accomplishing the intention of it.

2. That if it be of the mixed kind, partly soft, and partly hard, it will also most probably fail of success, not only from the impracticability of depressing the softer parts, but also because the more firm ones will either elude the point of the needle, and remaining in the posterior chamber, still form a cataract; or getting through the pupil into the anterior chamber, will there bring on pain and inflammation, and induce a necessity of dividing the cornea for their discharge.

3. That if the cataract be of the firm solid kind, and therefore capable of being depressed, yet in whatever part of the eye it shall happen to be placed, it will there remain undissolved, solid, and opaque; and, although removed from the pupil, yet prove some hindrance to perfect vision.

4. That, however successfully the depression may have been accomplished, the operation will necessarily occasion such disarrangement of the internal parts of the eye, as must cause very considerable mischief.

Mr. Pott observes, that these objections, if they have any real weight, are of equal force in every species of cataract; and therefore are the more worthy of our attention; since, if they be founded on truth, they render the operation improper; but if they be not, misrepresentation and fashion should never induce us to lay aside any means which have been, and still may be, advantageous to mankind. The first and second, from frequently repeated experience he affirms not to be true. He means that the operation of couching will not necessarily, nor even generally, be unsuccessful, merely because the cataract shall happen to be either partially or totally soft. On the contrary, although those

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those states will prevent perfect depression, yet, by the judicious use of the needle, a recovery of sight, the true end and aim of the operation, will be as certainly and as perfectly obtained, as it could have been either by depression or by extraction in the same subject; and that generally without any of the numerous and great inconveniences which most frequently attend the latter operation.

The third objection, our author observes, is specious, and therefore very generally credited. That it never happens, he will not take upon him to say, because so many have asserted it. But, he adds, when we consider how few have written from their own examination and experience, our faith will not be quite implicit. He is certain from repeated experience, that this opinion has not that foundation in truth which it is generally supposed to have; and that it has been hastily embraced without sufficient enquiry.

In prosecuting the evidence on this subject, Mr. Pott remarks, that when the opaque crystalline is in a state of dissolution, or the cataract is what is called perfectly soft, if the capsule of it be freely wounded by the couching-needle, the contents would immediately issue forth, and mixing with the aqueous humour, will render it more or less turbid; sometimes so much as to conceal the point of the needle, and the iris of the eye from the operator.

This is a circumstance, he continues, which has been observed by most operators, and has been mentioned by many writers; but it has always been regarded as an unlucky one, and in some degree preventive of success; which is so far from being the fact, that respecting this circumstance merely, all the benefit that can be derived from the most successful depression, or extraction, most frequently attends it, as Mr. Pott has seen in numerous instances.

The aqueous humour, however turbid it may become, will in a short space of time be again perfectly clear; and if no disorder of the capsule of the crystalline, previous or consequential, prevents, the rays of light will pass without obstruction through the pupil, and the patient will be restored to as perfect vision as could have followed the most successful operation of either, or of any kind in the same subject, and under the same circumstances.

When the cataract is of the mixed kind, partly soft, and partly hard, the immediate effects of the needle are somewhat different; the soft part of the cataract being less in quantity, as well as generally less soft; the aqueous humour is less turbid; and the firm part or parts of the crystalline will be very visible. In this state, those former parts will very frequently elude the attempts made by the needle to depress them; and will therefore remain in the posterior chamber. This is also reckoned one of the unfortunate circumstances; but though to an operator not aware of, nor acquainted with the consequence, it may have all the appearance of being so, yet, as Mr. Pott observes, it really is not; the true end and aim of the operation not being thereby necessarily frustrated. In this case, if the needle had been so used as to have wounded the capsule very slightly, it will sometimes happen that the firm part of the crystalline will remain in its nidus, and still form a cataract, which may possibly require a re-application of the instrument. This, Mr. Pott observes, is the worst that can happen, and occurs indeed very seldom. For if the capsule be properly wounded, so that the aqueous humour be freely let in, the firm part or parts, though very visible at first, and preventing the passage of light through the pupil, will in due time, in some longer, in others shorter, gradually dissolve, and at last totally disappear; leaving the eye as fair, as clear, and as fit for vision as any, the most successful operation, could have rendered it.

In order to ascertain the fact with greater certainty Mr. Pott, when he has found the cataract to be of the mixed kind, has sometimes not attempted depression; but has contented himself with a free laceration of the capsule; and having turned the needle round and round between his finger and thumb, within the body of the crystalline, has left all the parts in their natural situation. In those cases he has hardly ever known them fail of dissolving so entirely as not to leave the smallest vestige of a cataract. In a few instances, where he has had fair opportunity, he has pushed the firm part through the pupil into the anterior chamber, where it has always gradually and perfectly dissolved and disappeared, without producing any pain or trouble during the whole of that time.

Mr. Pott observes, that if the remarks above-mentioned be well founded, some other important consequences will result from them:

1st. If the soft cataract will, when its capsule is properly wounded, mix with the aqueous humour, and undergo so perfect a dissolution and absorption, as to leave the eye fair, clear, and fit for vision, and which he has often experienced beyond any doubt, it will then follow, that the softness of a cataract is so far from being an unlucky circumstance, that it is rather a fortunate one; as it enables the patient to receive the more early assistance; and that from an operation attended with less pain, and a less violation of parts, than a firmer one would necessarily acquire.

2dly. When the cataract is of the mixed kind, and which therefore frequently baffles all the attempts towards depression, the firmer parts may very safely be left for dissolution, and vision be thereby restored.

3dly. When the cataract shall happen to be of the firmer kind, and during an unsuccessful attempt to depress get through the pupil behind the cornea, disappointment will be so far from being the consequence, that if no other injury has been done to the parts within than what such attempt necessarily required, the displaced crystalline will gradually dissolve and disappear; and the patient will recover his vision as perfectly as he could have done by any operation. We now shall describe the best mode of depressing.

During this operation Mr. Hey directs the patient to be seated in a chair somewhat lower than that on which the operator sits, that the arm of the operator may not be much elevated. An elevated position of the arm soon produces fatigue, and renders the hand less steady. The eye of the patient should be exposed to the light of one window only, and that should admit no more light than is necessary, for seeing the interior parts of the eye distinctly. If the patient's head is placed a little obliquely to the light, the picture of the objects reflected by the cornea (which often prevents a distinct view of the cataract) is thrown to one side of the pupil, and then creates no impediment to the operation. A horizontal light is in this operation preferable to a sky-light. The head of the patient must be kept erect, or inclined a little forward, by an assistant who places one hand upon the forehead, and another under the chin, supporting at the same time the occiput by a pillow interposed between it and the breast of the assistant. The eye, which is not the immediate subject of the operation, should be kept steady by a proper bandage, and by a gentle pressure from that hand of the assistant which is placed upon the forehead. If a speculum oculi is not used, the operator may support the upper eye-lid with the thumb of one hand, and with the ring finger of the other hand, which holds the needle, depress the lower eye-lid till he has introduced the needle. After that, it is more convenient to have the lower eye-lid held down by an assistant. The tar-

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fus should be turned a little inwards, and the eye-lids gently pressed against the edge of the orbit, and the globe of the eye. This gentleman says he has found the common speculum oculi to be inconvenient, and has never tried that which is recommended by Mr. Benjamin Bell. The patient should be directed to turn his eye inwards, as if he were looking at his nose, that the part in which the puncture is to be made may present itself to the operator, and that the conjunctiva may be put upon the stretch. If the conjunctiva remains wrinkled where the needle enters the eye, the operator will find his instrument so entangled as greatly to impede the regularity of his motions.

The needle being besmeared with oil, should be pushed suddenly through the coats of the eye. The direction in which this is done is of some consequence, especially if a spear-shap'd couching needle is used. The needle should not be pushed through the sclerotic in a direction parallel to the iris; for pressure made in that direction is apt to give a rolling motion to the eye, and thereby alter the course of the needle. If the eye be made to roll towards the nose, the point of the needle will then be directed towards the iris, and the operator will be in danger of wounding it. This danger may be avoided by piercing the sclerotic with the point of the needle directed towards the centre of the eye. By this method the eye is rendered steady, and the needle will pass through its coats without any danger of wounding either the iris or ciliary process.

When the needle has pierced the coats of the eye, it must be pushed forwards in the same direction, till so much of the instrument is introduced, that its point, when brought forwards, will reach the centre of the crystalline. This part of the operation, as we have already observed, may be performed with greater exactness by the use of a short needle. If the length of the needle is little more than the diameter of the eye, the operator will be greatly assisted in judging when the point of his instrument has advanced to the axis of the pupil, which corresponds with the centre of the cataract. It is not absolutely necessary that the needle should be introduced at one determinate distance behind the ciliary ligament. Indeed, the want of steadiness in the eyes of some patients renders this impracticable; but our author considers the distance of about one-sixteenth of an inch to be the most convenient. The operation may be performed with great ease and safety, when the needle pierces the sclerotic near the ciliary ligament.

So far the operation must be conducted in the same manner, whatever be the state of the cataract. The remaining part of the operation must be varied according to the circumstances of the disease.

If, in bringing forwards the point of the needle, we perceive the cataract to advance, and dilate the pupil; we then know that the cataract is firm, and that the needle is in contact with its posterior part. The pressure used in bringing forwards the cataract, sometimes causes the point of the needle to sink so far into the crystalline, and to become so much entangled in its more tenacious part, that the depression may be completed, though the instrument has not been seen through the pupil. When, therefore, the appearance which has been mentioned takes place, our author does not persist in bringing forward the point of the needle, lest the iris should be injured by the too great dilatation of the pupil; but depresses the point, at the same time that he carries it backwards. If this motion of the needle removes the cataract from its place, the operation is usually concluded without any farther trouble.

If the cataract does not follow the motion of the needle, he cautiously brings forward its point through the softer

part of the crystalline, till he can see his instrument through the pupil, and then proceeds in his attempts to effect the depression. In these attempts he always moves the needle backwards as well as downwards; for the operator ought always to be sure, that his needle is behind the ciliary processes when he moves it upwards or downwards. Before Mr. Hey withdraws the needle, he usually elevates its point a little to see whether the cataract rises again when the pressure is removed. If it does, the pressure is renewed once or twice, and the needle is then withdrawn. He always endeavours to lodge the cataract below the place where his needle entered the vitreous humour, and withdraws the needle in a direction nearly parallel with the axis of the pupil.

Though Mr. Hey does not think it advisable to persist in pressing an entire cataract into the anterior chamber, when the advance of the cataract causes a large dilatation of the pupil; yet after the needle has wounded the capsule, a firm cataract, or at least its nucleus, will sometimes slip through the pupil without the design of the operator. This has been considered by some authors as a disagreeable circumstance, and has been ranked amongst the objections to the operation of couching. On the contrary, it ought to be considered as a favourable event, since the cataract always dissolves in the aqueous humour, and finally disappears without any injury to the eye. This, at least, has been the event in every case of the kind, which the author has seen. He has six or seven times seen the whole opaque nucleus fall into the anterior chamber of the eye, and very frequently small opaque portions. Indeed, if the cataract could, in all cases, be brought into the anterior chamber of the eye, without injury to the iris, it would be the best method of performing the operation. But this is not usually practicable; the softness, as well as the bulk of the cataract, presenting an obstacle to this process.

If the crystalline, or rather its capsule, is found to adhere in part to the iris, great caution should be used in our attempts to destroy the adhesion; as it is much more safe to repeat the operation after a gentle attempt, than by continuing the use of force to risk the danger of an inflammation. It is useful in this case to lift up the cataract with the needle, as elevation may be successful where depression has failed. Mr. Warner succeeded at the fourth operation, in destroying an adhesion of the iris; and the author has repeated the operation oftener than four times with advantage, rather than incur the hazard of inflammation, which might have left the patient in total blindness.

Hitherto the cataract has been considered as firm, and capable of bearing the pressure of the needle; but in the greater number of patients which have fallen under his care, the cataracts have been found so soft as to permit the needle to pass through them in all directions. In this state of the disease, he does nothing more than break down the texture of the cataract, and endeavour to puncture, or tear off, a portion of the capsule, that the aqueous humour may flow in upon the broken cataract. In doing this, it is common to see some fragments of the cataract fall, through the pupil, into the anterior chamber of the eye. Mr. Hey is always glad to see this take place, as he then knows that there is a passage opened for the admission of the aqueous humour, and that those opaque fragments, which have passed through the pupil, will soon disappear.

Sometimes the cataract is so uniformly soft, that the passage of the needle through it makes no alteration in its appearance. This species of cataract was considered by the late Mr. Sharp and Mr. Warner as incurable. In this opinion these excellent authors were certainly under a mistake;

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for we find that although an uniform softness of the cataract may require a more frequent repetition of the operation, it affords no permanent impediment to the cure. Upon repeating the operation in such cases, Mr. Hey has often found, that the first operation had produced more effect than at the time of operating it appeared to produce. The cataract, upon a subsequent operation, appears more violent, and irregularly opaque. Some portions may now be removed, which before appeared immovable; some fall into the anterior chamber; and the remainder becomes gradually dissolved in its original situation.

When both eyes are affected with a cataract, Mr. Hey usually operates upon them both at the same time; nor has he seen any reason for discontinuing this practice.

That gentleman always operates upon the right eye with his left hand. A surgeon may easily acquire the power of using his left hand in this operation, if he accustoms himself to bleed with the left hand, whenever a proper opportunity offers.

After the operation, we cover both the eyes, though only one may have been couched, with a broad piece of linen, spread with unguentum ceræ, and fastened to a ribbon tied round the head. The patient's face should not be exposed to a strong light, nor to the heat of a fire, till the tenderness of the eyes is gone off. A strict regimen should be observed for a few days; and a gentle laxative may usually be given with advantage.

When the nature and variety of the parts wounded in couching are considered, a person not accustomed to this operation might reasonably conclude, that it would usually be followed by a considerable degree of inflammation. Yet we may with truth assert, that when it is performed in the manner above described, the usual consequence is nothing more than a tenderness of the eye, which goes off by degrees, if the patient uses the proper cautions. Frequently the eye appears as free from inflammation as it did before the operation, excepting a slight redness in the conjunctiva, where the puncture was made. Nor is the operation itself attended with that degree of pain which one might reasonably expect. It is commonly spoken of by the patient as incon siderable.

Though the inflammatory affection, which is immediately subsequent to the operation, is generally slight, yet it must be confessed, that it is sometimes considerable; and we have also observed, that the patient's eye is more susceptible of inflammation, from any irregularity, for two or three weeks after the operation. Some of the worst attacks of inflammation, which Mr. Hey has seen, have come on at so late a period; when the patient, presuming upon the comfortable state in which he had found himself, has incautiously exposed his eye to a cold blast of air, or has caught cold by any other means.

In the case of subsequent inflammation, Mr. Hey places the greatest dependence upon the evacuation of blood from some branch of the temporal artery. The quantity and frequency of the evacuation must be directed by the circumstances of the case; but it ought to be used freely, till the inflammation begins to subside. Purgatives, and other cooling remedies should be added. Warm soft water, directed in a gentle stream across the eye, abates the pain in the acute stage of the inflammation. When that has somewhat subsided, the face, the neck, and head, if not covered with hair, should be frequently washed with cold water.

Sometimes, when the eye is not inflamed, the patient feels pain in the forehead, just above the eye-brow, which is now and then accompanied with sickness or reaching. This complaint is the most effectually relieved by an opiate.

We have seen a few instances where the eye, upon being examined some days after the operation, has appeared to be affected with an amaurosis. The pupil has been found largely dilated, and the patient has had a weak perception of light. We know not how to account satisfactorily for this accident, which, as far as we have observed, is more alarming than dangerous. In the few cases of this kind, which have fallen under our notice, bleeding has appeared to relieve the complaint; the iris has, by degrees, regained its contractile power, and the retina has been restored to its natural sensibility.

It would scarcely be necessary to mention the rising again of the cataract, when enumerating the consequences of the operation, but that some good authors have considered this as a circumstance, which affords an important objection to the operation of couching, and renders it fruitless. This circumstance may require a repetition of the operation, but throws no hindrance in the way of the cure.

If the cataract, though risen again into view, appears detached, so as to move sensibly and readily in the vitreous humour, with every motion of the head, it will generally, by degrees, subside, and finally disappear without any farther assistance.

A frequent and most important consequence of the operation, and one that succeeds the method of extraction, as well as that of depression, is an opacity of the capsule of the crystalline. This *secondary* cataract will appear when no inflammation has succeeded the operation. It will sometimes disappear by the effect of time, as in cases of cataract from blows or punctures; but this event is often slow, and always uncertain. If time does not remove this disease, recourse must be had to the needle. When an aperture has been made in the centre of the capsule, at the time of the depression, and remains so large as to enable the patient to see distinctly, the opacity of the surrounding part of the capsule need not be regarded. But if any opaque portions occupy the axis of the pupil, and do not soon show some return of transparency, it is proper to repeat the operation, for the purpose of breaking asunder, or removing the opaque portions.

When portions of the opaque capsule hang floating in the posterior chamber of the eye, it is difficult to pierce, or lay hold of them. The attempt to remove them must be made in different directions, yet with great caution, lest the iris should be injured. Mr. Hey has sometimes succeeded in detaching these portions by moving his needle upwards, when the motion downwards has failed to lay hold of them.

When the capsule appears in cross threads, like net-work, the instrument will readily break them asunder. Sometimes the capsule has a considerable degree of elasticity, and springs up again immediately with force after being depressed. When fragments of this kind are near the circumference of the crystalline, and do not materially interrupt the passage of the rays of light, it is the most prudent method to leave them, lest the ciliary processes should be injured by tearing them off.

As the opacity of the capsule, which forms the secondary cataract, is usually diminished in some degree by time, it may be well to consult the inclination of a patient with respect to the time and frequency of these operations. A labouring man, who has a family to maintain by his work, will not perhaps regard a frequent repetition of the operation, that he may the sooner return to his labour. Persons of a higher rank often prefer a delay.

The vitreous humour does not appear to suffer the least injury by the passage of the needle or cataract through it.

If there was any tendency in this humour to become opaque, we should frequently see this consequence ensue from the operation of couching. But no such consequence, we believe, was ever known to ensue. On the contrary, this humour seems to be in a proper state for the transmission of light, after the operation, as it was before.

Surgeons, who undertake the operation of couching, should not be induced, by their desire of completing the cure at one operation, to use long continued efforts to depress or break down a cataract. By such efforts there is great danger of injuring the eye. It has been too much considered as a matter of disgrace to the operator, if sight has not been immediately restored to the patient. The fear of this disgrace has probably confined many an unhappy sufferer to irremediable blindness.

There is no operation of surgery, which may not sometimes fail of success; but couching, when conducted in the manner above described, so rarely fails to restore a considerable degree of sight, if the cataract is not complicated with any other morbid affection of the eye, that it cannot be considered as attended with much uncertainty.

COUCHING-needle. See **NEEDLE.**

COUCO, or **Cuco**, in *Geography*, a district of Africa, under the eastern government of the kingdom of Algiers, which derives its name from the mountain at the foot of which the metropolis stood, or perhaps from the city itself, once the seat of a kingdom, magnificent and powerful. It was situated, in a triangular form, southward of Algiers and Boujeiah or Bugia, about 36 miles from the former and 20 from the latter, at the foot of the mountain surrounded with steep rocks, which served it as a strong defence. On the summit of this mountain was a great number of farms and villages, both populous and rich; one of which, containing 500 houses, had a large market every Friday, to which the neighbouring people resorted in great multitudes. The princes possessed likewise a port on the sea-coast called "Tamagus," between Bugia and Algiers, from which the city carried on a considerable trade in hides, wax, and honey, with Marseilles. The access to it was very difficult and dangerous, through narrow and rugged defiles, that a small number of men might overwhelm an enemy's army with stones; and besides, the city was fortified with strong high walls, on the side where it was least inaccessible. In this flourishing condition it continued, under its princes, till the beginning of the 17th century, when the king of Couco, then in alliance with Spain, ceded to it the port of Tamagus, which the Algerines gained possession of soon after. In order to terminate all intrigues with Spain, they demolished the metropolis, ravaged the adjacent plains, and obliged the inhabitants to flee to the mountains. The Turks, however, have regarded the city and country of Couco, on account of its vicinity to Algiers and the inaccessibility of its mountains, with suspicion and dissatisfaction, because it was a sure refuge to their enemies and criminals of state; and particularly to some of their deys, when they apprehended the displeasure of the Porte, or on any other occasion when they wanted an asylum. The Algerines have therefore frequently attempted to reduce the inhabitants to subjection. These are distinguished by the name of Arabians, Berberes and Azagues, and they value themselves on their independence; to the security of which they have sacrificed their wealth. From being once the richest people of all the inland countries in horses, cattle, grain, and fruits, and also from their manufacture of iron, and of linen and cotton luffs, they are sunk into extreme indigence, avoiding all commerce with their neighbours, lest they should excite the jealousy of the Algerines, and afford a pre-

tence for reducing them to the same condition of slavery with the other Arabs and Moors of Barbary.

COUCOU, probably the *Couchan* of Du Halde, a small town of Chinese Tartary on the northern frontiers of the province of Petcheli in China, seated on a hill near a river which falls into the Hoan-ho.

COUCOU-thasac, a town of Asia, in the country of Thibet; 4 leagues N. of Chateheou.

COUCOUR-HOTAN, a town of Asia, in the country of Thibet; 70 leagues W. of Turfan.

COUCOURON, a small town of France in the department of the Ardeche, with 927 inhabitants. It is the chief place of a canton which consists of six communes, and comprises a population of 4090 individuals on an extent of 162 kilometres and a half.

COUCY LE CHATEAU, or *Coucy le Châtel*, a small town of France in the department of the Aisne, 15 miles west of Laon and 9 miles north of Soissons, remarkable for the ruins of a castle built by the ancient lords of Coucy, and repaired and enlarged by Lewis Duke of Orleans, brother to Charles VI. king of France. It is the chief place of a canton, contains 800 inhabitants, and must not be confounded with *Coucy la Ville*, which is a village two miles distant from Coucy le Chateau. The canton itself contains 34 communes and 14992 inhabitants, on 275 kilometres. It was in the old castle of Coucy that the celebrated looking glass, or mirror manufactory of Saint Gobin, was originally established in 1691.

COUDOU, in *Zoology*, the *antelope*, *Antelope oreas* of Gmelin, *antelope oryx* of Pallas, *mazame* of Seba, African elk of Kolben, eland and elk antelope of Sparrman, and Indian antelope of Pennant, is an animal of a grey colour; having straight, tapering, sharp-pointed horns, furrounded at the base with a spiral ridge to the base. This animal inhabits India, Congo, and the vicinity of the Cape of Good Hope; found chiefly in the mountainous parts of the country, and living in herds, though the elder males are often solitary. They grow very fat, and are easily caught, as they cannot run swiftly, and often fall down dead during the chase. The coudou is thick in the body, strongly made, and near 5 feet high at the shoulder; the head is reddish, with a dusky line on each cheek, and a stripe of long loose hairs, on the forehead; the body is of blueish-ash colour, sometimes white and spotted with red and grey; it has a short black mane along the neck and ridge of the back; the tail is dusky, and tufted with black hairs at the end; the females have horns similar to those of the males, and both are made into tobacco-pipes by the Hottentots. The flesh is fine-grained, very juicy, and reckoned delicious. In this species the *lachrymal groove* is wanting.

COUDRAS, in *Geography*, a small island in the river of St. Lawrence, about 45 miles N.E. of Quebec.

COUDRAY SAINT GERMER, a small town of France in the department of the Oise, with 488 inhabitants. It is the chief place of a canton which has 19 communes and a population of 10239 individuals, on a territorial extent of 247 kilometres and a half.

COUDRETTE, **CHRISTOPHER**, in *Biography*, a French priest, who flourished last century, was intimately connected with the fathers of the port royal, in the contests which they engaged in with the Jesuits, and partook in the sufferings inflicted on the party that was condemned by the bull unigenitus. He was twice imprisoned for the boldness with which he avowed his sentiments. In 1761 he published, "A General History of the Jesuits;" in 4 vols. 12 mo. to which was added a supplement in two others. This was highly esteemed, and proved to be of considerable use in

the measures taken against that society. Coudrette died at Paris in 1774, highly respected for his zeal and talents, and also for the candour which was displayed in his writings. *Nouv. Dict. Hist.*

COVE, a small creek or bay, where boats and small vessels may ride at anchor, sheltered from the wind and sea.

COVE, or *Cove of Cork*, a market and post town of the county of Cork, Ireland, situated on the great island facing the entrance of Cork harbour. It was a very wretched place, but it has of late years been much improved. A fine quay has been built and many good houses. The admiral commanding on the Irish station, generally resides there; and a considerable retail trade is carried on to supply the ships in the harbour. There is a small barrack and a fort which commands the only passage for large vessels to the city of Cork. Opposite to this town is the anchorage for men of war, and large vessels; and here very large fleets are often moored, when collecting for the west India convoy. The islands of Spike and Haul Cowlin, which lie nearly opposite to Cove, have been fortified. The works on the former are very considerable. Cove is 131 miles S.W. from Dublin, and seven from Cork.

COVEL, JOHN, in *Biography*, an English divine born at Hornings-pearth in Suffolk, in 1638, and educated at the grammar-school at Bury. He was admitted into Christ's college Cambridge in 1654, where he took his degrees, and was chosen fellow. In the capacity of chaplain to sir Daniel Harvey he went out in the embassy to the Ottoman Porte, where he remained seven years. Upon his return he was created doctor in divinity, and was chosen in 1679 lady Margaret's preacher in the University. He advanced by degrees to several honourable and lucrative preferments in the church, and in 1708 obtained the office of vice-chancellor to the University of Cambridge, which he held with much reputation till his death in 1722, having attained to the great age of eighty-four. As an author, his chief work was entitled "Some account of the present Greek Church," &c. for which he collected materials while he was resident at Constantinople. The object of this work was to clear up some difficulties that occurred in the controversy between the celebrated Claude and M. Arnauld, doctor of the Sorbonne. By his contemporaries Dr. Covel was regarded as "a person noted for polite and curious learning, singular humanity and knowledge of the World." *Biog. Britan.*

COVELIACÆ, in *Ancient Geography*, a town of Vin-delicia, marked in the Peutingerian table.

COVELLIANI *Codices*, in *Biblical History*, five MSS. of different parts of the New Testament, brought from the East by John Covell, professor of divinity in the university of Cambridge, which came afterwards into the hands of Harley earl of Oxford, and, with the rest of the Harleian MSS. into the British Museum. They were collated by Mill. The 1st contains the four Gospels; the 2d is a manuscript of the Acts, Epistles, and Revelation, written in the year 1087; from several of its very extraordinary readings, it appears to be of no great value:—the 3d has the Acts of the Apostles, beginning with chap. i. 11. with all the Epistles, and was supposed by Mill to be 500 years old:—the 4th contains the Acts and Epistles, written in a modern hand:—the 5th, called likewise *Sinaiticus*, because Covell brought it from mount Sinai, contains the Acts, Epistles, and Revelation; but it has been injured, and rendered illegible in many places, by the damp, which has had access to it. It begins with Acts

i. 25, and the last lines of the book of Revelation are wanting. The 1st, 2d, and 4th have been examined by Griesbach.

COVENANT, in *Law*, the consent or agreement of two or more parties by deed in writing, sealed and delivered, to do or omit a direct act; which is a species of express contract, the violation or breach of which is a civil injury. The person who makes the covenant is called the *covenantor*, and he to whom it is made is the *covenantee*.

The remedy for breach of covenant is by a "writ of covenant," which directs the sheriff to command the defendant generally to keep his covenant with the plaintiff (without specifying the nature of the covenant), or shew good cause to the contrary: and if he continues refractory, or the covenant is already so broken that it cannot now be specifically performed, then the subsequent proceedings set forth with precision the covenant, the breach, and the loss which has happened thereby; whereupon the jury will give damages in proportion to the injury suffered by the plaintiff, and occasioned by such breach of the defendant's contract.

A covenant seems to be much the same with a *padum*, or *conventum*, among the civilians.

Covenant is either in *law* or in *fact*.

Covenant in *law*, is that which the law intends to be made, though it be not expressed in words: as, if the lessor demise, and grant a tenement to the lessee for a certain term: the law intends a covenant on the lessor's part, that the lessee shall, during the term, quietly enjoy the lease against all lawful incumbrances. 1 *Inlt.* 384.

Covenant in *fact*, is that which is expressly agreed between the parties, and inserted in the deed.

There is also a covenant *merely personal*, and a covenant *real*. Fitzherbert defines a covenant *real* to be that whereby a man ties himself to pass a thing real, as lands or tenements, or to levy a fine on lands, &c. Covenant *merely personal*, is where a man covenants with another by deed to build him a house, or to serve him, &c. F. N. B. 145. 5 *Rep.* 10.

The covenant *real*, to convey or dispose of lands, seems to be partly of a personal, and partly of a real nature. For this the remedy is by a special writ of covenant, for a specific performance of the contract, concerning certain lands particularly described in the writ. It therefore directs the sheriff to command the defendant, here called the deforciant, to keep the covenant made between the plaintiff and him concerning the identical lands in question: and it is upon this process that fines of land are usually levied at common law; the plaintiff, or person to whom the fine is levied, bringing a writ of covenant, in which he suggests some agreement to have been made between him and the deforciant, touching those particular lands, for the completion of which he brings his action. And for the end of this supposed difference, the fine or *finalis concordia* is made, whereby the deforciant (now called the cognizor) acknowledges the tenements to be the right of the plaintiff, now called the cognizee. And moreover, as leases for years were formerly considered only as contracts or covenants for the enjoyment of the rents and profits, and not as the conveyance of any real interest in the land, the ancient remedy for the lessee, if ejected, was by writ of covenant against the lessor, to recover the term (if in being) and damages, in case the ouster was committed by the lessor himself: or, if the term was expired, or the ouster was committed by a stranger, claiming by an older title, then to recover damages only. No person could at common law take advantage of any covenant or condition, except such as were parties or privies thereto; and, of course, no grantee or assignee of any reversion or rent. To remedy which, and more effectually to secure

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figure to the king's grantees the sp'ls of the monasteries were only dissolved, the Statute, 2 Hen. VIII. c. 34. gives the assignee of a reversion (after notice of such assignment) the same remedies against the particular tenant, by entry or distress, for waste or other forfeitures, non-payment of rent, and non-performance of conditions, covenants, and agreements, as the assignor himself might have had: and makes the assignee liable, on the other hand, for acts agreed to be done by the assignor, except in the case of warranty. *Black. Com.* vol. ii.

Covenants are not only *personal* and *real*; but they are *principal* or *collateral*, tending to the support of the land or thing granted, or *collateral* to it; and they are *affirmative* where something is to be performed, or *negative*; *executed*, or what is already done, or *executory*:—a covenant binding a person to do something in *future* is for the most part *executory* (1 Vent. 176. Dyer, 112, 271.) The law does not seem to have appropriated any set form of words, as absolutely necessary to be used in creating a covenant; and therefore it seems that any words, expressing the party's concurrence to the performance of a future act, will be sufficient for that purpose. A covenant differs from a condition in this respect, that a condition gives entry, and covenant gives an action only. (Owen 54.) A person cannot have action of covenant upon a verbal agreement, for it cannot be granted without writing, except by special custom. (F.N.B. 145.) All covenants between persons must be to do that which is lawful; otherwise, they will not be binding: and if the thing to be done be impossible, the covenant is void. (Dyer 112.)

Covenant to stand seized to uses, is when a man that hath a wife, children, brother, sister, or kindred, doth by covenant in writing under hand and seal, agree that for their or any of their provision or preferment, he and his heirs will stand seized of land to their use, either in fee-simple, fee-tail, or for life. The use being created by the stat. 27 Hen. VIII. c. 10. which conveyeth the estate as the uses are directed; this *covenant to stand seized* is become a conveyance of the land since the said statute. The considerations of these deeds are, natural affection, marriage, &c. and the law allows in such cases considerations of blood and marriage to raise uses, as well as money and other valuable consideration when a use is to a stranger. *Plowd.* 302.

COVENANT, in *Ecclesiastical History*, denotes a contract or convention agreed to by the Scots, in the year 1638, for maintaining their religion free from innovation. In 1551, the general assembly of Scotland drew up a confession of faith, or national *covenant*, forming a system of discipline or ecclesiastical polity, and condemning episcopal government, under the name of Hierarchy. In 1588, during the apprehension of an invasion by the Spanish armada, a bond was framed for the maintenance of true religion, and the defence of the king's person and government, in opposition to all enemies foreign and domestic. This contained a confession of the Protestant faith, a particular renunciation of the errors of popery, and the most solemn promises, in the name, and through the strength, of God, of adhering to each other in supporting the former, and contending against the latter, to the utmost of their power. The king, the nobles, the clergy, and the people subscribed with equal alacrity. This national covenant in defence of religion was renewed at different times during the reign of James. It was revived with great solemnity, though with considerable alterations, in the year 1638. The subscribers engaged by oath to maintain religion in the same state as it was in 1580, and to reject all innovations introduced since that time. This oath annexed to the confession

of faith received the name of the *covenant*; as those who subscribed it were called *Covenanters*. In the assembly at Glasgow which met in 1638, the covenant was ordered to be signed by every one, under pain of excommunication. See *Solemn League and Covenant*.

COVENANT, in *Theology*, is much used in connection with other terms. Thus, the *covenant of grace* is that which is made between God and those who believe the Gospel, whereby they declare their subjection to him, and he declares his acceptance of them and favour to them. The Gospel is sometimes denominated a *covenant of grace*, in opposition to the Mosaic law. The covenant of grace, denoting the promise or grant of favours and blessings to mankind in Jesus Christ, our Lord, was first published to Adam (Gen. iii. 15); nor could it be wholly unknown to the patriarchs; but it was more clearly revealed to Abraham (Gen. xii. 3. xvii. 7. xviii. 18. xxii. 16, 17, 18.); and hence it has been sometimes called the "Abrahamic covenant."

Covenant of redemption denotes a mutual stipulation, tacit or express, between Christ and the Father, relating to the redemption of sinners by him, previous to any act on Christ's part under the character of Mediator. By this covenant, it is said, Christ undertook to perform those services, to submit to that humiliation, and to endure those sufferings, which were indispensable on his part in the accomplishment of the work assigned him; and God the Father, on the other hand, stipulated, that he would impart those assistances and encouragements, and bestow those tokens of favour and reward, which were necessary to the ultimate success and honour of Christ's undertaking. See *REDEMPTION*.

Covenant of works signifies, in the language of some divines, any covenant whereby God requires perfect obedience from his creatures, in such a manner as to make no express provision for the pardon of offences to be committed against the precepts of it, on the repentance of such supposed offenders, but pronounces a sentence of death upon them: such, they say, was the covenant made with Adam in a state of innocence, and that made with Israel at Mount Sinai.

It is also alleged, that so far as the light of nature reaches in discovering our duty, we are *all* so born under such a covenant as the former, as by sin to be exposed to death; which may be considered as including not merely the separation of soul and body, and the consequent dissolution of the mortal part; but likewise such degrees of future punishment as it shall seem to the Supreme Judge righteous and fit to inflict. Hence it has been inferred, that the covenant was made with Adam, not only for himself, but in some measure for his posterity; so that he was to be considered as the great federal head and representative of all who were to descend from him. And it has been suggested that, in consequence of this damage to which Adam's posterity were to become liable by his transgression, they would have received some additional advantages from his continued obedience: such, it may be conceived, though not mentioned in scripture, as would secure the honours of divine justice in the establishment of such a constitution. Accordingly, it has been asserted, that all Adam's posterity would, after his short trial, have been confirmed in a state of immutable happiness.

In order to shew that a constitution, such as that which some divines have supposed to be the covenant with Adam, whereby all mankind should become obnoxious to eternal misery for the transgression of one common head, is consistent with divine justice; many have pleaded, that in consequence of such an appointment, we stood so fair a chance for happiness, that if we had then existed, and the proposal had been made to us, we must in reason have been contented

to put our eternal all on that issue: so that G d might reasonably impute that to us *as our act*, which he knew *would have been our act*, if we had been consulted on the occasion. But nothing would seem sufficient to vindicate such a proceeding, unless it were to suppose (as an obscure writer has done), that the souls of all the race of Adam were for that moment actually brought into being, and gave personal consent to that covenant, after which they were reduced to a state of insensibility, till the appointed moment came for their animating their respective bodies. See Sale's Koran, c. vii. p. 135. *note e.* Howe's Works, vol. ii. p. 253, 254. See FALL, IMPUTATION, and ORIGINAL SIN.

COVENANT, *Solemn League and*, was established in the year 1643, at Edinburgh by the persuasion of sir Henry Vane, and formed a bond of union between Scotland and England. It was sworn and subscribed by many in both nations, who hereby solemnly abjured, and engaged to extirpate popery and prelacy, and combined together for their mutual defence. The subscribers of the covenant vowed also to preserve the reformed religion established in the church of Scotland; but, by the artifice of Vane, no declaration more explicit was made with regard to England and Ireland, than that these kingdoms should be reformed, according to the word of God, and the example of the purest churches. It was approved by the parliament and assembly at Westminster, and ratified by the general assembly of Scotland in 1645. King Charles I. disapproved of it when he surrendered himself to the Scots army in 1646: but Charles II. in 1650 declared his approbation both of this and the national covenant by a solemn oath; and in August of the same year, made a farther declaration at Dumferling to the same purpose, which was also renewed on occasion of his coronation at Scone in 1651. The covenant was ratified by parliament in this year, and the subscription of it required by every member, without which the constitution of the parliament was declared null and void. It produced a series of distractions in the subsequent history of that country, and was voted illegal by parliament, and provision made against it. Stat. 14 Car. II. c. 4. It was ordered by parliament to be burnt by the hands of the common hangman, and the people assited with great alacrity on the occasion.

COVENANT, *Suit*. See SUIT.

COVENANT, *Ark of the*. See ARK.

COVENT-GARDEN. St. Paul's church in this parish has often been noticed for the boldness and excellence of the carpentry displayed in its roof: which was a few years ago destroyed by a fire that accidentally happened, but has again been rebuilt on its former plan. The Tuscan portico to this church, being reckoned as a model of good architectural taste, we have represented it as a specimen of that order, in *Plate XIV.* of *Architecture*.

COVENTRY, in *Geography*, a city in Warwickshire, England. It is situated on a gentle eminence, and according to Camden "is set on a low ground, but by east it somewhat condescendeth." The city having never suffered from fire, still bears strong marks of antiquity in its narrow dark streets, and impending buildings, some of which almost meet each other from the opposite sides of the way, through the extravagant projection of their different stories. Dugdale and other antiquaries agree in deriving Coventry from *Coven* or *Convent*, with the addition of *Tre*, the British word signifying town; and yet the learned historian of Warwickshire suggests doubts whether the *original* name of the river Sherburn that passes through the city might not have been *Cune*, and thence *Cune-tre* and Coventry. The origin of the place appears to be involved in impenetrable obscurity, but

it is certain that the present site is not altogether that of *ancient* Coventry, which is demonstrated by the discovery of many foundations on the bank, north-west of the city, where there is a place still called St. Nicholas' church yard. The Convent above alluded to is said by John Rous in his MS. chronicle (preserved in the Cotton library and printed by Hearne) to have been at one time under the governance of the Abbess *Saint Oiburg*, but as this holy virgin's name does not appear in Capgrave's calendar of English Saints, we must reject this part of his assertion and admit that the Convent was burnt in 1015, when Canute and the traitor Eadric invaded Mercia and destroyed many towns in Warwickshire; on the ruins thus occasioned, Leofric, earl of Mercia, founded a new monastery in 1043 for an abbot and 24 Benedictine monks, which William of Malmesbury says was afterwards "enriched and beautified with so much gold and silver that the walls seemed too narrow to contain it, inso much that Robert de Limesie, bishop of this diocese in the time of king William Rufus, scraped from one beam that supported the shingles 500 marks of silver." We shall be the more particular in noticing the "Priory of Coventry as it is acknowledged to have been of infinite use to the city during its prosperity." Leofric dedicated the church and monastery to the honour of God, the Virgin Mary, St. Peter the Apostle, and All Saints, and presented it with one half of the town of Coventry, and 23 lordships, which gifts were confirmed by king Edward the Confessor, who granted the abbot and monks many valuable privileges afterwards increased by pope Alexander, and the succeeding kings of England. Dugdale speaks of this foundation in his history of Warwickshire as "the chief of all the religious houses in these parts," and as "the only one of Monks in this county." It appears that Leofric had a castle at Coventry, and that he had been instrumental in placing Edward the Confessor on the throne; these facts sufficiently account for the interest he took in the prosperity of the place, and for the influence by which he accomplished his wishes; but if our ancient historians are to be credited, he held the inhabitants in unjustifiable servitude from which they were relieved by the following means. Leofric married the pious and beautiful Godeva, descended from Thorold, and sister of Thorold, sheriffs of Lincolnshire. This lady moved by the oppressions of her lord's tenants seized on every opportunity to intercede in their favour, till wearied by her incessant importunity, he peevishly offered to grant her requests provided she would consent to ride naked through the town: Dugdale says in "sight of all the people." Godeva agreed to this indecent proposal, and contrived to accomplish her unpleasant penance, covered by her flowing tresses; and thus obtained a charter of freedom for the grateful citizens who placed portraits of the earl and Godeva in one of the south windows of Trinity church about the time of Richard II.; Leofric was represented holding the charter in his right hand with this inscription on it:

"I, Luriche, for the love of thee

"Doe make Coventre toll free."

Some authors assert that Leofric repenting his rash proposal, commanded every person to retire from the streets and the fronts of their houses during the lady's progress, under pain of death, but that one curious person procured a glance which has obtained him the appellation of "Peeping Tom of Coventry," and the honour of a statue looking out of a window in one of the streets of the city: Dr. Pegge, however, produces many arguments to invalidate the whole story. These are inserted in Mr. Gough's edition of Camden's Britannia, to prove that the present annual procession of the inhabitants with a naked figure is founded on historical

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error. Contrary to subsequent custom, Leofric and Godeva were interred in the *two porches* of their monastic church, to which the latter gave vast treasures by will. Previous to the conquest, the diocese of Litchfield and Coventry included Chester; after that event, a synod held at London, by Lanfranc, archbishop of Canterbury, decreed that no episcopal seats should be fixed at inconsiderable towns; in consequence there was a transfer from Litchfield to Chester, and hence through the influence of Robert de Limeley, bishop of this see, who obtained the custody of Leofric's monastery from William Rufus, and the authority of a bull from pope Paschal II. the episcopal seat was again removed from Chester to Coventry, where the office of abbot became utterly suppressed. The bishop's palace was situated at the north-east corner of St. Michael's church-yard, but not a vestige of it now remains; five of Limeley's successors styled themselves *ishops of Coventry*, and the priors of St. Mary's received summons to parliament. In the reign of king Stephen the monks suffered (in addition to their losses by the peculations of Limeley) the misfortune of having their church and other buildings converted into fortifications, and themselves ejected by Robert Marmion, a powerful chief, then possessor of Tamworth castle, in the progress of his hostilities against the earl of Chester; but they were soon afterwards released from their intruder by the ensuing singular accident: Marmion had surrounded his new fortrefs with secret pit-falls to destroy his opponents, but, making a sortie at the head of his garrison, his horse fell with him into one of them in the hurry and confusion of the moment, where he was immediately killed by a soldier belonging to the earl of Chester's army. According to an inquisition quoted by Dugdale, taken about the reign of Edward I., this priory had the first voice in electing the bishop of the diocese of Coventry and Litchfield; the prior was lord of the town, holding a moiety, with the whole barony, of the king in *capite* by the service of two knights fees in the army, besides which he also held the earl's part; with the former he had a market weekly, and an annual fair of eight days duration, a coroner, and free warren in all his demefne lands, and "being privileged of murder, had gallows, pillory, tumbrel, assise of bread and beer; as also fealty of his burghers, and appearances at his court twice in the year." It will appear from this inquisition that Coventry was in a double sense completely in the power of the priory; as the bishop of the diocese possessed the abbacy, all ecclesiastical affairs came under the cognizance of the bishop, the prior, and chapter collectively, and every temporal concern has been shewn to have been within their jurisdiction. That the city flourished under their government, may be inferred by the decrease of the population immediately after the dissolution of the priory, 30 Henry VIII. when the annual value was estimated at 731l. 10s. 5d. John Hales, whose memory is still revered by the citizens, represented to the protector Somerset, that the inhabitants were reduced from 15,000 to 3,000 by the above event, but this statement was incorrect, as the population amounted to 7,000 in 1520, as appears from an exact enumeration taken at that period and recorded in the city leet book. Nothing now remains of this important priory, except some fragments of one of the towers of the church, and a small portion of the cells. The temporal history of Coventry may be traced with tolerable certainty from the reign of king Stephen, when Ranulph, otherwise *Gernons*, hereditary possessor of the manor of Cheylesmore, on the south side of the town, where the castle of the earls was situated, having adopted the cause of the empress Maud, and being repulsed in an attempt upon Lincoln, retired to his

manion; but, finding it in the king's possession, he raised works against it, and, after various conflicts, was driven from it wounded. Ranulph died under sentence of excommunication for some offence committed against Durand, bishop of Chester, and was succeeded by his son, earl Hugh, who, adopting his father's principles, excited the citizens of Coventry to rebel against Henry II. for which that monarch fined them, and deprived them of their privileges; but they recovered the latter after the death of earl Hugh, by paying the king 20 marks. Ranulph, the last earl of the name, granted the citizens their possessions in free burghage, and a town-court, where he permitted them to try causes, relative to himself and them, before a person learned in the laws, of their own appointment. This grant was enlarged and confirmed by Henry III., who added a fair for eight days, on the feast of the Holy Trinity, at the earl's request: besides these important advantages they received others of great benefit to the city. The burgesses and inhabitants obtained the king's letters patent, 13 Ed. I., authorising them to take toll of all commodities offered for sale for three years, the produce to be applied in paving the town; but these letters were renewed 20 years after; and from those addressed to the *bailliff*, it appears the appointment of that officer had originated between the 13 and 33 of Edw. I. In the second year of Edward III. the priory and inhabitants procured a patent for six years' toll, the produce to be expended in walling Coventry, to which were added two years more, at the intercession of John of Eltham, who then had an estate in reversion in the manor of Cheylesmore, on condition he might be exempted from the expence of erecting the gates. Six years afterwards, they had licence to make conduits throughout the town; and subsequently they purchased an exemption from toll, scavage, postage, and murage, throughout the kingdom for ten marks. Queen Isabel, possessing a life estate in the manor, and influenced by the interest vested in Edward, prince of Wales, duke of Cornwall, and earl of Chester, prevailed upon Edward III., in the 18th year of his reign, to make Coventry a corporation, to consist of a mayor, bailiffs, &c.; at the same time authorising them to erect a prison in the queen's portion of the town, for the confinement and punishment of malefactors who were thus placed in their custody. Richard Stoke, mayor, laid the first stone of the walls at New-gate, in 1355; but the money raised by toll for this purpose was afterwards augmented by heavy taxes on the laity only, to build a wall of stone embattled, for which they had a licence from Edward, the Black Prince, 37 Edward III., who granted the corporation a fee farm of the place. Numerous privileges were bestowed at this period, which enabled the citizens to erect a most admirable inclosure to the town, and many magnificent gates. In the 21st year of Richard II., that monarch visited Coventry, in order to prevent the intended combat between Henry, duke of Hereford, and John, duke of Norfolk; and in 1404, Henry IV. held a parliament there, from which all lawyers or persons learned in the law were expressly excluded: this *parliamentum indoctorum* was held in the priory. In the preceding reign, several wealthy citizens presented the corporation with messuages and rents to support the future expences of that body; but the most valuable gift the place had ever received, was the charter of Henry VI., who erected it into a distinct county, under the title of the county of the city of Coventry. This charter, which ordains the offices peculiar to this description of district, was confirmed by Edward IV. Another parliament held there in the reign of Henry VI. was

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called *Parliamentum diabolicum* by some of our historians, from the numerous attenders passed in it. The earl of Warwick afterwards held the city for Henry VI.; and Edward IV., thinking it would be too well defended for speedy reduction, passed on to London. When the kingdom submitted to him after the battle of Barnet, and the death of Warwick there, Coventry was disfranchised; nor did the corporation receive their privileges again, till they had been purchased with 500 marks. Edward IV. visited the city in 1474 with his queen; and Henry VII. slept at the mayor's house, when passing through the place, subsequent to the battle of Bosworth-field. Great part of the wall, the majority of the 32 towers, and several of the 12 gates of Coventry, were taken down in 1661, as a punishment and disgrace to the citizens for closing the latter against Charles I. Aug. 13, 1642. Previous to the period when Coventry was garrisoned by parliament, Charles requested to reside there for some time, and to quarter his forces in the city and neighbourhood. This the corporation refused; but offered to receive the monarch only, with many professions of loyalty. Exasperated at the denial, the king attacked and forced open one of the gates with his cannon, but was at length repulsed by the citizens, who remained during the rest of the contest unmolested. The ecclesiastical government of this city is deputed to an archdeacon of Coventry; and the city, previous to the reformation, contained, besides the priory, the grey friars, on the south side of the town, the church of which was burnt in the reign of Edward III., as is evinced by a beautiful octagon tower and spire yet remaining. The friars to whom it belonged were celebrated for performing sacred mysteries or interludes on moveable stages in different parts of the city. Their pageants amounted to 40, and included the interval between the creation and the last day. These were exhibited on Corpus Christi day, to crowds who entered the city from the surrounding neighbourhood. The Carmelites, or white friars, were provided with a residence and church at Coventry by sir John Poultney, who was four times mayor of London, in 1342. The dormitory, refectory, the west gate, and part of the cloisters, are all that remain of this foundation. These are situated at the east end of the city, and now used as a house of industry. Spence hospital, founded for the reception of the lepers of Coventry, by Hugh, earl of Chester, on the west side of the city, is reduced to the ruins of the chapel and gateway; but Bablake hospital, founded in 1506, by Thomas Bond, mayor, still flourishes: Bond placed 10 poor men, a woman, and a priest, in this hospital, the revenues of which were vested in the city, after its suppression in the reign of Ed. IV., and they now support 18 old men and a nurse. Part of the same building furnishes a residence for a number of boys, who are clothed in blue, and educated through the justice and benevolence of Thomas Wheatley, mayor, in 1556, whose servant, sent to Spain by him to purchase some barrels of steel gads, brought home, through an unaccountable mistake, a number of cakes filled with ingots of silver and cochineal, which were offered for sale in an open fair as the articles alluded to, and bought as such. This worthy ironmonger and card-maker made every possible effort to discover the person who sold them, but without success. He then honourably converted the profits to this charity, to which he added part of his own property. Grey Friars hospital was founded in 1529, by William Ford, merchant, of the staple of this city, augmented by William Pisford, his executor, and subsequently by other benefactions for the reception and maintenance of 14 aged and poor persons,

for whom a nurse is also provided. St. John's hospital, in Bishop-street, was founded by Lawrence, prior of Coventry, in the reign of Henry II. This hospital came into the possession of John Hales, in the reign of Henry VIII. who intended to found a college similar to that of Westminster; but, after various disappointments, was under the necessity of removing from the White Friars church, where he had commenced his operations, to St. John's. Hales left an estate of 43*l.* per annum (since greatly improved) to endow a free school, held at present in an aisle of the chapel. St. Michael's church originally belonged to the priory, afterwards became a vicarage, and finally came to the crown. The body of this beautiful structure was, in part, rebuilt in 1434. The length of the church is 303 feet, the height of the steeple the same, and the breadth of the church 104. The tower is richly ornamented with niches and saints, and the taper spire rises majestically from an octagon; nor are the exterior and interior less light and elegant. The steeple was built in 1372 by two brothers, Adam and William Botoner, who expended 100*l.* per annum on it for 22 years; and it was completed by two ladies of the same family who built the middle aisle. Trinity church almost vies with St. Michael's in beauty; in which was buried Dr. Philemon Holland, an indefatigable translator, school-master, and physician, and the first that gave "*Camden's Britannia*" in English. He died in 1636, aged 85. The beautiful cross, 57 feet high, erected by sir William Hollis, lord mayor of London, between 1541 and 1544, has been entirely removed, after previous gradual mutilation. St. Mary-hall, situated near St. Michael's church, is a magnificent and interesting structure, principally erected about the time of Henry VI.: the entrance is a rich gate-way, the key-stone to the arch roof of which is sculptured with a representation of the Deity crowning the Virgin, (it being dedicated to St. Mary, and founded by the brethren of St. Mary gild.) The great room has a large window at the north end, containing, in nine divisions, the whole length figures of as many kings of England, with various armorial bearings; and the windows on the east side are decorated with the portraits of several eminent persons formerly members of the Trinity gild, who came into possession of the hall on the union of the gilds. The Drapers'-hall, lately rebuilt, is a handsome structure ornamented with Tuscan pilasters. Besides the hospitals and free-school of Coventry, there have been several considerable sums given to the citizens, particularly by sir Thomas White, in trust, for the distribution of the interest in various ways. Coventry was a long time celebrated for its extensive manufacture of cloth, and caps, or bonnets, which it maintained from a period previous to 1346, till the last century. After the latter period, the inhabitants made large quantities of shags, tammies, camblets, lastings, &c.; but these pursuits having declined, the manufacture of silk ribbands was introduced about an hundred years past, which has proved highly beneficial to the city, and is carried on to a vast extent there, and in the neighbourhood. Amongst the arts lost at Coventry may be noticed a manufactory of thread, which, before 1581, was nearly proverbial for the excellence of the blue with which it was dyed. Coventry possesses the advantage of a canal communicating with London and Liverpool, through the grand junction and grand trunk canals, and Oxford (the Coventry and Oxford canals uniting the two former); it also serves for the conveyance of coal from the neighbouring collieries of Hawksbury, &c. The city is supplied with water for domestic purposes from a spring near Swanwell, without

the priory gate, which is held by the corporation. Coventry is situated 91 miles from London, and contains three churches, one quaker, and five other meeting-houses, with a Roman catholic chapel. The population, as returned under the general survey in 1801, was 16,034, but is certainly erroneous, as former calculations led to an estimation exceeding 20,000. Dugdale's Warwickshire, Gough's edit. of Camden, and Pennant's Journey from Chester to London. The exact situation of the spire of St. Martin's church in this city, was ascertained in the Government Trigonometrical Survey in the year 1799, by observations from Aubrey-hill station, distant 94,262 feet; from Epwell, distant 122,672 feet, and bearing $2^{\circ} 3' 42''$ S. E. from the parallel to the meridian of Dunmore; and from Broadway beacon, distant 158,205 feet; whence is deduced its latitude $52^{\circ} 24' 26'' 3$ N., and long. $1^{\circ} 50' 5'' 5$ W. of Greenwich royal observatory.

Coventry stands upon a remarkable stratum of red sandy earth, in some places hardened into stone; to the north-west of this town the coal measures begin to crop-out; (see COAL and COLLIERY;) in the park near the town a very soft grey stone is dug, which easily pounds to sand for domestic purposes, making of mortar, &c. The ploughed lands near Coventry furnish a great variety and quantity of rounded quartz pebbles, with which the city is paved, some are black, deep red, brown, white, and others veined like marble; they run generally from the size of hen's eggs to that of a man's fist. Since the year 1776 this city has enjoyed the benefit of inland navigation. In addition to the particulars of this grand undertaking, given under the article CANAL, we here beg to mention, that the termination of the branch, or principal line as some call it, in the city of Coventry, is upon very high ground at the N.W. end of the town, upon the strong red clay soil, in which all this branch from Longford is cut.

In ascending the steep hill from the deep vale which runs through Coventry, the canal company's house, facing the top of the street, presents a very striking and fine object, and the sight of the yards, wharfs, and canal beyond it, is not less gratifying to the curious traveller.

The canal terminates in two parallel branches or basons, forming a spacious yard between them for the stowage and landing of coal and other rough goods, and the canal basons are embanked by narrow wharfs or campheads, raised so much above the level of the yards, that carts and waggons when backed up against them have their bottoms level with the camphead, and very nearly so with the gunwales of the loaded boats floating in the bason, by which arrangement the utmost facility is afforded to a vast number of carts and waggons to load with coal, lime, and other goods at the same time, immediately from the barges, either by barrows, or throwing the coals by shovels full on to the wharf, and then into the carts, &c. and the busy scene is among one of the most gratifying which can well be conceived.

Further north, the eastern bank of the bason is occupied by a range of warehouses, with roofs projecting over the boats lying in the bason, which can thus be loaded or unloaded in safety in any weather, and at certain intervals gate ways or openings are made from the street on the south-east side of the warehouses for carts and waggons, to back up to the camphead as already described, and cranes are contrived to hoist goods out of the barges, and at once deposit them in the dry in any weather, in carts or waggons, and the contrary in loading goods into the barges, where it is not necessary to lodge them for a time in the warehouse: these cranes are constructed with booms instead of jibs, and are worked with chains. In one of the gate-ways

of the company's house, at the entrance to the yard, a weighing engine is fixed for weighing at once the quantity of coals loaded into a cart or waggon, after taking its empty weight as it passed over the machine in entering the yard; over this is a spacious count-room for the meetings of the canal proprietors, and a suite of counting houses and offices for the business of the company and residence of its officers. About one mile from Coventry, on the road towards Nuneaton, a meadow is watered, whenever circumstances suit, by the waste water discharged over a river on the canal bank, or a trunk through it; a practice which we earnestly wish to see more generally adopted. About $2\frac{1}{2}$ miles from Coventry there is an aqueduct and considerable embankment over the Sow river. S. E. of Bedworth, about half a mile, there is an immense deep-cutting and spoil-banks, 12 yards deep in the middle, and 600 yards long through the grand ridge of the island, which here is formed of the red clay stratum before mentioned.

A branch and rail-way proceed from the line at Shackleton's bridge to the coal-pits at Bedworth town, which are 120 yards deep. Sir Roger Newdigate's canal branches from the line on the N.W. of the summit, and rises by several locks, and in its course crosses the summit again before it enters his park. See NEWDIGATE'S CANAL.

COVENTRY, a township of America, in the state of Connecticut and county of Tolland, 20 miles E. of Hartford city. It was settled in 1709, being purchased by a number of Hartford gentlemen of one Joshua, an Indian.—Also, the north-easternmost township of Kent county in the state of Rhode island: containing 2477 inhabitants.—Also, a township in the northern part of New Hampshire, in Grafton county; incorporated in 1764, and containing 80 inhabitants.—Also, a township in the state of Vermont, and county of Orleans. It lies in the north part of the state, at the south-end of lake Memphremagog. Black river passes through this town in its course to Memphremagog.—Also, a township of Chester county in the state of Pennsylvania.

COVENTRY, a town of America, in the state of Connecticut; 14 miles N. E. of Norwich.

COVENTRY *Ad.* in *Law.* See MAYHEM.

COVENTRY *Bell.* in *Botany.* See CAMPANULA.

COVENTRY *remedy.* in *Pharmacy.* a title given by Mr. Wilmer to a preparation of sponge powder, formed by taking of burnt sponge, powdered, and common salt, each three drams, mixing them, and dividing them into 12 powders; and highly celebrated by Mr. W. in scrofulous affections, and particularly in the case of the bronchocele. Mr. W. employed it at Coventry sometimes in its pure state, combined with a sufficient quantity of honey, to form it into a bolus, and sometimes united with calcined cork and pumice stone.

COUEPIA, in *Botany.* Lam. Enc. Juss. 341. Aubl. Guian. 519. tab. 207. Class and order, *monadelphia polyandria.* Nat. Ord. *Rosaceæ.* Juss.

Gen. Ch. *Cal.* Perianth top-shaped or funnel-shaped; tube somewhat curved, inflated in the upper part; border with five egg-shaped segments. *Cor.* Petals several, but not seen by Aublet, having fallen off before he found the plant. *Stam.* Filaments numerous, united at the bottom by a rim which crowns the entrance of the calyx. *Pist.* Germ superior, egg-shaped, lessened at the base so as to appear peduncled; style filiform, long, curved; stigma acute. *Peric.* Drupe egg-shaped, with a thick, fibrous, woody, or coriaceous, much cracked bark: nut thin, brittle; kernel oval-oblong, bitter, two-lobed, covered with a reddish bark.

Obs. This generic character so nearly resembles that of Aublet's

Aublet's *coupi*, *Acia* of Schreber, that La Marck agrees with Schreber in thinking that the two ought to constitute one genus. See *ACIA*, where Aublet's *coupi* is described.

Sp. A tree about sixty feet high, with a grey smooth bark, and hard, heavy, reddish wood; branches crooked, compound, spreading wide. *Leaves* two inches and a half long, alternate, oval, acute, thin, smooth, entire, undulated; petioles short, clothed with red hairs. *Flowers* in bunches at the ends of the branches. A native of the forests of Guiana, about thirty leagues from the sea.

COVER, &c. in *Military Language*. See COVERTURE.

COVER of a Bank, in *Canal Works*, is a term for the area or space of ground, covered by the base or seat of its banks.

COVERDALE, MILES, in *Biography*, an English prelate, born in Yorkshire, during the reign of Henry VII. was educated in the religion of the times, and became an Augustine monk. At the era of the Reformation he became a zealous preacher in its defence. In 1532 he published Tindal's "English Version of the Bible," to which he had given much assistance, and, in 1540, he gave another revised edition of it with notes. See BIBLE. In 1551, king Edward appointed him to the bishopric of Exeter; from which he was ejected during the reign of Mary, and imprisoned. The king of Denmark interfered in his behalf, and the good bishop was allowed to retire from the walls of a prison to a foreign country. In the next reign he was invited home, and might have been restored to his bishopric, could he have conformed to certain rites and ceremonies which were considered by many others, as well as himself, the relics of popery, and unfit to be sanctioned by their example. As he could not comply with the terms held out, he was neglected, and for a considerable time without any provision. Having suffered from poverty and old age, he was at length noticed by Grindal, bishop of London, who presented him with the living of St. Magnus, London-bridge, where he exercised his ministerial functions, without wearing the offensive habits. He became popular, and was, through the jealousy of his superiors, compelled to relinquish his professional duties, a short time before his death, which was about the year 1567, being something more than 80 years of age. *Biog. Brit.*

COVERED Flank, *Fountain, Medals*. See FLANK, FOUNTAIN, MEDAL.

COVERING, in *Architecture*, one of the principal parts of a building. See ROOFING.

COVERIPATAM, in *Geography*. See CAVERIPATAM.

COUERON, a town of France, in the department of the Lower Loire, and district of Savenay, seated on the Loire; 2½ leagues W. of Nantes.

CO-VERSED SINE, in *Trigonometry*, a term which some people use for the remaining part of the diameter of a circle, after the versed sine is taken from it.

COVERT, in *Law*.—*Feme COVERT*, *famina viro copertu*, denotes a woman married, and so covered by, or under the protection of, her husband. See COVERTURE.

COVERT-way, in *Fortification*. See CHEMIN COVERT.

COVERT-way, *Second*, called by the French *mont chemin couvert*, is a covert-way at the foot of or beyond the glacis.

COVERTURE, in *Law*, is particularly applied to the state and condition of a married woman; who, by the laws of our realm, is under *covert-baron*, or *sub potestate viri*, and called a *feme-covert*; and therefore disabled to make bargains with any, to the prejudice of herself, or her hus-

band, without his consent or privity; or at least without his allowance and confirmation; and if the husband alien the wife's lands, during the marriage, she cannot gain say it during his life.

In law, the husband and wife are considered as one person; and therefore a man cannot grant any thing to his wife, or enter into covenant with her (Co. Litt. 112); for the grant would be to suppose her separate existence; and to covenant with her would be to covenant with himself; hence it is generally true, that all compacts between husband and wife, when single, are voided by the intermarriage. (Cro. Car. 551.) A woman, indeed, may be attorney for her husband (F. N. B. 27.); for that implies no separation from, but is rather a representation of, her lord. A husband may also bequeath any thing to his wife by will; for that cannot take effect till the coverture is determined by his death. (Co. Litt. 112.) The husband is bound to provide his wife with necessaries by law, as much as himself; and if she contracts debts for them, he is obliged to pay them, (Salk. 118.) but for any thing besides necessaries, he is not chargeable. (1 Sid. 120.) Also, if a wife elopes, and lives with another man, the husband is not chargeable even for necessaries; (Stra. 647.) at least if the person, who furnishes them is sufficiently apprized of her elopement. (1 Lev. 5.) If the wife be indebted before marriage, the husband is bound afterwards to pay the debt; for he has adopted her and her circumstances together. (3 Mod. 186.) If the wife be injured in her person or property, she can bring no action for redress without her husband's concurrence, and in his name, as well as her own; (Salk. 119. 1 Roll. Abr. 347.) neither can she be sued without making the husband a defendant. (Bro. Cor. 173. 1 Leon 311. 1 Sid. 120.) This was also the practice in the courts of Athens. There is one case, indeed, in which the wife shall sue and be sued, as a *feme sole*; viz. where the husband has abjured the realm, or is banished (Co. Litt. 133.); for he is then dead in law; and the husband, being thus disabled to sue for or defend the wife, it would be very unreasonable if she had no remedy, or could make no defence at all. In criminal prosecutions, it is true, the wife may be indicted and punished separately, (1 Hawk. P. C. 3.) for the union is only a civil union. But in trials of any sort, they are not allowed to be evidence for, or against each other. (2 Hawk. P. C. 431.) However, when the offence is directly against the person of the wife, this rule has been usually dispensed with: and therefore, by statute 3 Hen. VII. c. 2. in case a woman be forcibly taken away, and married, she may be a witness against such her husband, in order to convict him of felony. For in this case she can with no propriety be reckoned his wife; because her consent was wanting to the contract: and, besides, there is another maxim of law, that no man shall take advantage of his own wrong; which the ravisher here would do, if by forcibly marrying a woman, he could prevent her being a witness, who is perhaps the only witness, to that very fact.

In the civil law the husband and wife are considered as two distinct persons; and may have separate estates, contracts, debts, and injuries; and therefore, in ecclesiastical courts, a woman may sue and be sued without her husband. (Cod. 4. 12. 1. 2 Roll. Abr. 293.)

But though our law in general considers man and wife as one person, yet there are some instances in which she is separately considered; as inferior to him, and acting by his commission. Consequently, all deeds executed, and acts done by her, during her coverture, are void; except it be a fine, or the like matter of record, in which case she must

be solely and secretly examined, to learn if her act be voluntary. (Litt. § 669, 770.) She cannot by will devise lands to her husband, unless under special circumstances; for at the time of making it, she is supposed to be under his coercion. (Co. Litt. 112.) Also, in some felonies, and other inferior crimes committed by her, through constraint of her husband, the law excuses her; (1 Hawk. P. C. 2.) but this extends not to treason or murder.

By the old law, the husband might give his wife moderate correction. (1 Hawk. P. C. 130.) But this power of correction was confined within reasonable bounds; (Moor, 874.) and the husband was prohibited from using any violence to his wife, *aliter quam ad virum, ex causa regiminis et castigationis uxoris sue, licite et rationabiliter pertinet.* (F. N. B. 85.) The civil law gave the husband the same, or a larger authority over his wife; allowing him, for some misdemeanors, *flagellus et fustibus acriter verberare uxorem*; for others, only *modicam castigationem adhibere.* (Nov. 117. c. 14. and Van Leeuwen. in *loc.*) But with us, in the polite reign of Charles II., this power of correction began to be doubted (1 Sid. 113. 3 Keb. 433.); and a wife may now have security of the peace against her husband (2 Lev. 128.), or, in return, a husband against his wife. (Stra. 1207.) Yet the lower rank of people, who were always fond of the old common law, still claim and exert their ancient privilege; and the courts of law will still permit a husband to restrain a wife of her liberty, in case of any gross misbehaviour. (Stra. 478, 875.) Blackst. Com. book 1.

COUESNON, in *Geography*, one of the principal rivers of the department of Ille and Vilaine, formerly part of Brittany in France. It runs through Fougeres, and empties itself into Cancale bay, below Pontorson, on the flat sandy shore of Mont St. Michel. Its course is extremely variable, on which account it was to be rendered navigable in 1804, by collecting its waters at the east of Mont St. Michel, and embanking its bed between two moles from Pontorson, as far as the sea.

COUET, a town of Switzerland, in the bishopric of Bâle; 5 miles S. W. of Delmont.

COUFA, a town of Asiatic Turkey, in the Arabian Irak; 122 miles S. of Bagdat.

COUGAN, a town of China, of the third rank, in the province of Pe-tche-li; 6 leagues N. of Pa.

COUGH, in *Medicine*, a sudden, violent, and sonorous expiration, in a great measure involuntary, and excited by a sensation of the presence of some extraneous matter or irritating cause in the lungs or windpipe.

This sensation of obstruction or irritation, although sometimes perceived in the chest, especially near the pit of the stomach, is most commonly confined to the trachea, or wind-pipe; and especially to its aperture in the throat, which is termed the glottis. Yet this is seldom the seat of the irritating cause; which is generally situated at some distance from the glottis, and often in parts unconnected in structure, or by proximity, with the organs of respiration. We have other instances in the animal economy of distant irritations being referred, by sympathy, to particular points. Thus the irritation of the urine, distending the bladder, is chiefly perceived at the external termination of the urethra; at which point, also, a pain is felt, when the bladder is irritated by a stone within it. A view of the various causes of cough will evince the truth of the above position.

Cough is rather to be considered as a symptom of different morbid states of the viscera, than itself a disease; and hence Dr. Cullen has omitted to arrange it among his genera of diseases. Of the various irritations which give

rise to cough, some occur within the cavity of the chest; others are external to that cavity; and some exist even in the viscera of the pelvis.

1. Of those causes of cough, which take place within the thorax, the disorders of the lungs themselves are the most common; especially the inflammation of the mucous membranes lining the passages, which excites the catarrhal cough, or common cold. See CATARRH. In this case, the cough is at first excited by pain and soreness of an inflamed membrane, and is dry; but afterwards, as the inflammation subsides, a thick mucus is poured out, which obstructs the respiratory passages, and a cough is excited in order to expel it. The cough is then said to be moist, or accompanied by expectoration. In the chronic catarrh, or the cough and dyspnoea of old people, where, from frequent attacks of cough, there is much relaxation of the membranes in those passages, a copious effusion of mucus takes place into the cells of the lungs, which occasions an almost incessant coughing, by which, and the great impediment to the function of respiration, they are frequently destroyed. See CATARRHUS *fenilis*. Another common cause of cough, which has its seat in the lungs, is inflammation of those organs, whether in the form of *pleurisy* or *peripneumony*. These diseases, indeed, do not very essentially differ, except in violence and extent, from the acute catarrh; they are more dangerous, and more rapid in their progress, and the constitution is excited to a highly febrile condition. See these articles. Even after the acute state of inflammation may have subsided, a cough, attended with extreme danger, sometimes continues to be excited, by collections of pus, or abscesses, which ensue in the substance of the lungs, and terminate either in consumption, or suffocate the patient, by suddenly bursting; more rarely the pus is discharged gradually from a small aperture, and the patient recovers. In such cases, the fever, originally acute, is converted into a hectic, with daily chills, succeeded by heat and flushing of the face, night sweats, and emaciation. Another frequent origin of cough, is the rupture of some of the blood-vessels of the lungs, and the consequent effusion into the cells, of blood, which is expelled by the cough, that its irritation excites, constituting what is technically termed, *hemoptoe*, *hemoptysis*, or spitting of blood. When the vessels of the lungs are thus ruptured, they seldom heal readily, but degenerate into ulcers, which pour out a purulent matter; and, by this discharge, the vital powers are gradually worn down and destroyed. This is a common source of consumption, or phthisis pulmonalis. See CONSUMPTION. A cough is excited, and the same fatal disorder is so induced, by the existence of tubercles in the lungs; these are little tumours, which gradually inflame, and ulcerate, and produce the same consequences as the ulcerations from hæmoptysis. Calculi, or stony concretions, are sometimes formed in the lungs, and the irritation which they produce necessarily excites a cough, which is liable to terminate in consumption. For an ample account of the occurrence of such pulmonary concretions, the reader may consult Morgagni de Sed. et Caus. Morbor. Epit. xv. art. 20. See also Cullen's First Lines, § 883.

There is yet another source of irritation within the lungs, of which cough is an attendant; namely, an effusion of serum into the parenchymatous substance of the lungs, or into the cellular membrane, which connects the cells and blood-vessels together. This has been called *anasarca pulmonum*, or dropy of the lungs, and is marked by great difficulty of breathing, with a sense of weight and oppression in the chest, occasioned by the compression of the air-cells, and vessels, by the accumulated water; hence also great irregularity

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irregularity of pulse, frightful dreams, imperfect sleep, &c. are among its symptoms. It has been suggested by Dr. Darwin, that this form of dropsy may be distinguished from hydrothorax, or dropsy of the chest, in which the water is effused between the ribs and the lungs, by the circumstance, that the patient is greatly oppressed when he lies on his back, in the latter case; while the change of position in the dropsy of the lungs occasions little or no aggravation of the symptoms; because the water, confined within the cellular structure of the lungs, cannot change its position as in hydrothorax. *Œdema* of the legs often accompanies both these diseases. See *Dropsy*.

Cough is likewise a symptom arising from other morbid changes, within the cavity of the chest, but external to the lungs. Besides the hydrothorax, or effusion of serum into the sac of the pleura, a similar effusion into the pericardium; or investing membrane of the heart, produces effects resembling those just enumerated. Inflammation of the pericardium, and of the heart itself, is also accompanied by cough, and other symptoms, not easy to be distinguished from those of pleurisy and peripneumony. And instances are on record, in which a deposition of fat between the laminae of the mediastinum, which separates the two lobes of the lungs, has excited cough, with dyspnoea, &c. and terminated in death.

2. But although cough is most frequently occasioned by disorders of the organs of respiration themselves, or other morbid changes in the cavity which they occupy; it is, nevertheless, often excited by disorders of parts external to the cavity of the thorax, which affect the respiratory organs, either by the vicinity of their situation, or through some medium of sympathy, which cannot always be traced. In these cases, the cough is generally dry, inasmuch as the irritating cause is external, and not any obstructing matter in the lungs themselves. This, however, is by no means a complete criterion of the seat and nature of the cause; for, in the beginning of catarrhal and pneumonic coughs, there is generally no expectoration; as well as in those coughs arising from tubercles, or vomices, before the matter finds an opening into the cells of the lungs.

Disorders of the viscera of the abdomen, especially of those which lie in contact with the diaphragm, (the muscular curtain, separating the cavities of the belly and chest,) frequently induce a cough. A short dry cough is an invariable symptom of inflammation of the liver, whether acute or chronic, and accompanies the various tubercular and other obstructions in that organ. Hence inflammation of the liver is not unfrequently mistakenaken for inflammation in the lungs; and in some of the chronic diseases of the liver, we have occasionally found the cough complained of, as the most urgent symptom. The presence of pain in the right side, shooting up to the top of the shoulder, the dryness of the cough, and pain, enlargement, hardness, or uneasiness on pressure, below the ribs of that side, will afford the best means of distinguishing, whether a disease of the liver is the origin of the cough. Disorders of the stomach are, also, often accompanied with a cough of the same dry and teasing nature, especially when that organ is over-distended with food, or is in the opposite condition of emptiness. A short cough is, therefore, a frequent symptom of indigestion, and hypochondriasis, or of that weakness of the stomach, which is popularly termed *bilious*. In short, there is scarcely a viscus, in the cavity of the abdomen, the irritation of which, in a state of disease, has not excited cough. Disorders of the spleen, pancreas, and even the kidneys, have all given rise to this symptom; and external tumours, attached to them, have had the same effect. See Morgagni *Epist.* xix.

art. 57, 58, &c. Any distension of the abdomen, which, by its pressure upwards, impedes the descent of the diaphragm, and consequently the expansion of the lungs, occasions cough. Thus, in the ascites, or dropsy of the belly, the water—in tympanites, the air—in corpulency, the fat in the omentum—and, in pregnancy, the gravid uterus; all have the effect of exciting cough, in many constitutions.

It is scarcely necessary to mention, that any irritation in the windpipe, will immediately excite cough; whether it be permanent, as catarrhal, inflammation, or that of croup; or temporary and accidental, as when a particle of food or drink passes into it. But even irritations in the head, by an unobserved sympathy, produce a cough. Thus the introduction of the finger into the external *meatus* of the ear, occasions an uneasy sensation in the windpipe, which is immediately followed by coughing. And cough is not an uncommon symptom of dentition in young children; but it may be doubted whether the irritation of the rising teeth in the gums, or of the bowels, which are commonly disordered by dentition, be the exciting cause of the cough.

Having enumerated the various circumstances from which cough may originate, and briefly pointed out the most obvious means of distinguishing its seat and cause, it will be unnecessary here to detail the different remedies and modes of treatment which the difference in the nature and origin of the disorder will demand. It is sufficient to have referred the reader to those diseases with which it is connected, and by the cure of which, it will be removed. Before we conclude this article, however, we cannot refrain from pointing out a practical inference of the highest importance, which results from a consideration of the facts here detailed. It is, that we have hence a demonstration of the absurdity and falsity of those pretensions of empirics, and good lady-doctors, who offer to cure all coughs by the same remedy; regardless, generally ignorant, indeed, of the difference in the origin, seat, and nature of the diseases, of which cough is only a symptom. This inference may be deduced, in fact, from various other symptomatic complaints, such as headache, (see *CEPHALALGIA*,) sickness at the stomach, &c.; but is in no instance more conspicuous than in the disorder of which we now treat. See Sauvage's *Nosol. Meth. Class. v. Ord. i. Gen. 5. Tussis*.

COUGH, in *Ferriery*, is a disease to which horses are very subject. Some of these are symptomatic of a consumption, when they have been of long continuance, and are attended with loss of appetite, wasting of flesh, and weakness. Other coughs proceed from phlegm and slimy matter that stuff up the vessels of the lungs: in this case, which is of the asthmatic kind, the horse's flanks have a quick motion; he breathes quick; his cough is sometimes dry and husky, sometimes moist; before which he wheezes, rattles in the throat, and throws out of his nose and mouth a quantity of white phlegm, especially after drinking, or when he begins or ends his exercise.

These coughs should be distinguished from that thickness of wind, which is occasioned by full or foul feeding, want of exercise, or their being taken up from winter's grass. These are easily cured by proper diet and exercise; and the other disorders may be relieved, and totally cured, if it happens to a young horse, and is not of long continuance, by the following treatment. Bleeding should be used, in proportion to the state of the horse with respect to flesh; mercurial medicines are of great service: a mercurial ball, with two drams of calomel may be given at night, and a common purge in the morning; or the following, which is recommended

commended by Mr. Gibson: take gum galbanum, ammoniacum, and assa-fœtida, of each two drams; fine alnes, one ounce: *tellur* one dram; oil of anniseed, two drams; oil of amber, one dram; with honey enough to form the whole into a ball. These may be repeated at proper intervals: and during the intervals, and for some time after, one of the following balls may be given every morning: take cinnabar of antimony, finely levigated, six ounces; gum ammoniacum, galbanum, and assa-fœtida, of each two ounces; garlic, four ounces; saffron, half an ounce: let the whole be mixed into a paste with honey. Exercise and moderate diet are also essential to the effect of any remedy. In dry coughs, which are the nervous asthma of horses, moderate bleeding is proper; two drams of calomel, mixed with an ounce of diapente, may be given for two nights, and a purging-ball in the morning. This purge may be repeated with one mercurial ball once in eight or ten days; after which, one of the following balls, about the size of a pigeon's egg, may be taken every day for two months, or longer: take native cinnabar, half a pound; gum guaiacum, four ounces; myrrh, and gum ammoniacum, of each two ounces; Venice soap, half a pound; mix the whole with honey, or oxymel of squills. In obstinate dry coughs, the following has been found an useful remedy: take gum ammoniacum, squills, and Venice soap, of each four ounces; balsam of sulphur, with anniseeds, one ounce: beat them into a mass, and give them as the former. Young horses are subject to cough in cutting their teeth; bleeding and warm washes are generally sufficient for removing this complaint: but in such subjects, the cough often proceeds from worms; if this be the case, anthelmintic medicines should be given. See ASCARIDES, and HORSE WORMS.

COUGH, *Chin.* See HOOPING COUGH.

COUGH, called the *bugk*, is a disease to which young bullocks are subject. In this disorder, the wind-pipe and its branches are loaded with small taper worms. Farmers count the disease incurable; but fumigations with mercurials, as cinnabar, or with fœtids, as tobacco, might prove serviceable. Phil. Trans. vol. *slx.* part ii. p. 247.

COUGIN-PE, in *Geography*, a post of Chinese Tartary: 30 miles S. of Tchahan Soubrahou.

COUGOU, the *Koukou* of Edriss, and said to be called *Fiddri* by the natives, is a district in the interior part of Africa; mentioned by Hornemann in his journey: in which, it is said, there is a large lake from four to eight days' journey in circumference, according to the dry or rainy season, and which receives a river from the east. If this report may be credited, and the day's journey be estimated at 20 miles, this lake may perhaps be the real receptacle of the Niger.

COUGOUAR, in *Zoology*, the name given by Buffon to the *puma* or American lion of Hernandez, the panther of Lawson, the puma or brown cat of Pennant, and *FELIS concolor* of Gmelin; which see.

COUGUAR of *Pennsylvania*, a species of *Felis*, the body of which is remarkably thin and long. The body, from the neck to the tail, is 5 feet 4 inches long; the tail 2 feet 6 inches; the fore part of the body is 1 foot 9 inches high. It is of a reddish tawny colour above, and whitish on the lower parts of the body. It inhabits the mountains of Pennsylvania, Virginia, Carolina, and Georgia, in North America.

COUHAGE, or STINKING-BEANS. These are a kind of kidney beans imported from the East Indies, where they are used as a cure for the dropsy. The down growing on the outside of the pod is so pointed, as like a nettle to sting

the flesh, though not with so painful a sensation. This, by a corruption of the word, is called *couvitch*, which see.

COUHE', in *Geography*, a small town of France, in the department of Vienne, with 482 inhabitants. It is the chief place of a canton, which reckons 9072 inhabitants, upon a territorial extent of 240 kilometres and 10 communes. Couhé is situated 21 miles S. of Poitiers, on a small river which falls into the Clain.

COVIN, in *Law*, a deceitful compact, or agreement between two or more, to deceive or prejudice others. As, if a tenant for life, or in tail, conspire with another, that this other shall recover the land which the tenant holds, in prejudice of him in reversion. Plowd. 546.

Covin is commonly conversant in and about conveyances of land by fine, feoffment, recovery, &c.; and then it tends to defeat purchasers of the lands they purchase, and creditors of their just debts; and so it is used in deeds of gift of goods: it may be likewise sometimes in suits of law, and judgments had in them. But wherever covin is, it shall never be intended, unless it appears and be particularly found: for covin and fraud, though proved, must nevertheless be found by the jury, or it will not be good. Brownl. 188. Bridgm. 112.

Dr. Skinner takes the word to be a corruption of the Latin *conventum*, and therefore writes it *coven*. See CONSPIRACY.

COVING, in *Building*: When houses are built projecting over the ground plot, and the turned projection arched with timber, lathed and plastered; the work is called *coving*.

COVING *Corniche*. See CORNICE.

COVINUS, among the *Ancients*, a kind of chariot, in which the Gauls and Britons used to fight in battles. This was a terrible instrument of destruction; being armed with sharp scythes and hooks for cutting and tearing all who were so unhappy as to come within its reach. This kind of war-chariot was made very slight, and had few or no men in it besides the charioteer; being designed to drive with great force and rapidity, and to do execution chiefly with the hooks and scythes. Mela, l. 3. c. 6. Tacit. Vit. Agric. c. 36.

COUKUL, in *Ornithology*, a name given by Buffon to the eastern black cuckoo of Latham, or *CUCULUS orientalis* of Gmelin; which see.—And also to the black Indian cuckoo of Edwards, or *CUCULUS niger* of Gmelin; which see.

COUL, or COWL, a sort of monkish habit worn by the Bernardines and Benedictines.

The word is formed from *cucullus*, by confounding the two first syllables into one, as being the same twice repeated.

There are two kinds of couls; the one white, very large, worn in ceremony, and when they assist at the office; the other black, worn on ordinary occasions, in the streets, &c.

F. Mabillon maintains the coul to be the same thing in its origin with the scapular. The author of the apology of the emperor Henry IV. distinguishes two forms of couls: the one a gown reaching to the feet, having sleeves, and a capuchin, used in ceremonies; the other a kind of hood to work in, called also a *scapular*, because it only covers the head and shoulders.

COULACISSI, in *Ornithology*, a name given by Buffon to the Philippine Parrakeet of Latham, or a variety of the *PSITTACUS galgulus* of Gmelin; which see.

COULAM, in *Geography*, a town of Hindoostan, on the southern coast, in the country of Tinewally or Palamcottia;

cotta; 15 miles N.E. of Cape Comorin. N. lat. 8° 10'. E. long. 77° 20'.

COULAN, a town of Hindoostan, on the coast of Malabar, in the country of Travancore; 52 miles N.W. of Travancore. N. lat. 8° 54'. E. long. 76° 34'.

COULANGES LA VINEUSE, a small town of France, in the department of the Yonne, 3 miles S. of Auxerre; remarkable for its excellent wine, from whence it derives the name of *Colonia Vinosa*. It has 1654 inhabitants, and is the chief place of a canton, which, in 15 communes and on a territorial extent of 157 kilometres and a half, comprizes a population of 6685 individuals.

COULANGES Sur Yonne, a small town of France, in the department of the Yonne, 12 miles S. of Coulanges la Vineuse, and 6 miles N. of Clamecy; chief place of a canton, with a population of 1068 individuals. The canton itself has 11 communes and 7234 inhabitants, on a territorial extent of 217 kilometres and a half.

COULANS, a town of France, in the department of the Sarthe; 7 miles from Le Mans.

COULAVAN, in *Ornithology*, a name given by Buffon to the *ORIOLOS Chineusis* of Gmelin; which see.

COULET. ANNE PHILIBERT, in *Biography*, an engraver, born at Paris in 1738. This fair artist studied under Aliamet, and afterwards under Louis Lempereur, and has done great credit to her instructors. In 1770 she was received member of the Royal Academy at Paris. By her hand we have several landscapes and sea-views, executed in a very agreeable manner. We shall mention the following: "La Belle Après-dînée," from Vernet, lengthways; "La Partie de Plaisir à la Campagne," from the same; "Les Pêcheurs Napolitains," from the same. Huber, Strutt, Heineken.

COULEUVRE, in *Geography*, a town of France, in the department of the Allier; 2 leagues N.E. of Cerilly.

COULIBOEUF, a small town of France, in the department of Calvados, with 405 inhabitants; but the canton, of which it is the chief place, counts 12,555, in 32 communes, on a territorial extent of 187 kilometres and a half.

COULIHAUT, a town of the island of Dominica, on the W. coast; 16 miles S. of Portsmouth. N. lat. 15° 30'. W. long. 61° 20'.

COULNEY, or FOULNEY, a river of England, which runs into the Ouse in Yorkshire.

COULOMBIERS-LUSIGNAN, LES, a town of France, in the department of the Vienne, and district of Poitiers. See LUSIGNAN.

COULOMBS, a town of France, in the department of the Eure and Loire.

COULOMMIERS, a small town of France, in the department of Seine and Marne, situated in a fertile plain on the right shore of the great Morin; 15 miles S.E. of Meaux, 30 miles N.E. of Melun, and 40 E. of Paris. It is the chief place of a district, has a sub-prefect, an inferior court of justice, a register office, and a population of 3533 individuals. The canton contains 15 communes and 14,696 inhabitants, on a territorial extent of 172 kilometres and a half. Coulommiers has some excellent tan-yards; and its cheese is reckoned the best of the whole department.

The principal trade of the district is with corn, wine, cheese, and fish. It contains 4 cantons, 80 communes, and 49,420 inhabitants, on an extent of 952 kilometres and a half.

COULON, or DALAI, a large lake of Chinese Tartary, in the country of the Kalkas. N. lat. 49°. E. long. 116° 54'.

COULON-CHAUD, in *Ornithology*, a name given by Buffon to the Turnstone or Sea-Dotterel of some writers, the Hebridal Sandpiper of Pennant, the *Arenaria* of Brisson; and the *TRINGA interpres* of Gmelin; which see.

COULONGE, in *Geography*, a town of France, in the department of the Aisne, and district of Chateau-Thierry; 4½ leagues N.E. of Chateau-Thierry.

COULONGE, a lake of Upper Canada, formed by the Utawas river, and extending about 4 leagues in length. See GRAND CALUMET.

COULONGES, a small town of France, in the department of the Deux Sèvres, with 1729 inhabitants. The canton, of which it is the chief place, has 14 communes and 11,407 inhabitants, on a territorial extent of 285 kilometres.

COULONGHE, a town of France, in the department of the Orne; 7 miles N.E. of Domfront.

COULONS, a town of France, in the department of Loiret; 7 miles S.W. of Gien.

COULTER, in *Husbandry*, that part of a plough which forms the edge, standing before the share of the plough, and cutting the clods as the share tears them up. The coulter is an iron instrument of two feet eight inches in length, of near two inches breadth, and near one inch thick. It is driven through the beam of the plough, and fixed in its proper direction by a wedge. See PLOUGH.

The modern improvement of the plough by Mr. Tull, gives it four coulters; the consequence of which is, that the earth ploughed up is cut four times as small as by the common plough, which has only one.

In all coulters, the length and direction are to be nicely regulated. The cutting the hole and driving the wedge, regulate the direction; and its length is altered from the beam, by the driving it farther down, as its point wears away.

None of these coulters ought to descend so low as the share, except when the land is to be ploughed very shallow; it is always sufficient for them to cut through the turf, let the plough go as deep as it will. In ploughing shallow, the fin of the share must also be broad enough to cut off the fourth piece or furrow; else that lying very fast, will be apt to raise up the groundwrist, and throw out the plough; but when the land is ploughed deeper, the groundwrist will break off this fourth furrow, though the fin be not broad enough to reach it. Tull's Husbandry.

COULTER-NEB, or COUNTER-NEB, in *Ornithology*, a name by which the people in some parts of England call the *anas arctica clusii*. See ALCA *arctica* and PUFFIN.

COULTSCHA, in *Geography*, a town of Asia, in Thibet; 50 miles S.E. of Sarangapoor.

COUMA, in *Botany*, (Coumier; Enc.) a tree, more than thirty feet high, and about two in diameter, with a grey thick bark, yielding by incision a large quantity of milky juice, which soon hardens into a resin, much resembling ambergris; branches triangular, very compound. Leaves egg-shaped, acute, entire, smooth, of a fine green above, paler underneath; petioles short, channelled. They grow three together from each knot of the branches, and from the central spring two, three, or four buds; and as these lengthen, the lower leaves fall off, forming knots at the place where they have been attached. Flowers unknown. Berries reddish, globular, a little flattened at the summit, growing several together, each on a long peduncle; in the axils of the deciduous leaves. Seeds from three to five; bedded in a brownish pulp. A native of the forests of Guiana and Cayenne. The unripe fruit abounds in an acrid milky juice, which at length thickens, becomes somewhat clammy,

clammy, and acquires an agreeable taste. It is then brought to market by the negroes, and served up by the Creoles in their deserts.

COUMADENI, in *Ancient Geography*, a people who inhabited the southern part of the isle of Corsica. Ptolemy.

COUMAROUNA, in *Botany*, Lam. Enc. Aubl. Guian. tab. 295. (Keizia; Scop. Baryosima tongo; Gært. 579.) Nat. Ord. *Leguminosæ*. Juss.

Gen. Ch. *Cal* Perianth one-leafed, top-shaped, purple, coriaceous, three-cleft; two upper divisions very large, concave; the lower one very short, obtuse. *Cor*. Petals five, unequal, attached to the lower part of the calyx; three up right, large, marked with violet veins; two inclining, shorter. *Stam*. Filaments eight, united towards the bottom, attached to the base of the calyx; anthers small, roundish. *Pist*. Germ superior, oblong, compressed, enclosed in the tubular part of the stamens; style curved; stigma obtuse. *Peric*. Drupe ovate-oblong, slightly acuminate, pale yellow; rind thin, smooth, shining; flesh succulent, in small quantity, drying up as the fruit ripens; stone the form and size of the drupe, thick, hard, beset on all sides with short rigid somewhat fascicled hairs or bristles, one-celled, valveless. *Seed* solitary, much shorter and narrower than the cavity of the stone, oblong, lenticularly compressed, slightly wrinkled, black, shining, with an aromatic smell, and a taste like that of bitter almonds, but stronger and more pleasant.

Sp. C. odorata. A tree from sixty to eighty feet high, about three and a half in diameter, with numerous twined wide-spreading branches. *Leaves* alternate, pinnated; leaflets in two or three pairs, oval-oblong, entire, acuminate, firm, smooth; common petiole about fourteen inches long, russet, channelled on the upper side. *Flowers* purple-violet, in axillary and terminal racemes. A native of the forests of Guiana. The Creoles put the kernels into their cabinets, to preserve them from insects, and to give them an agreeable smell.

COUMOUR, in *Geography*, a post of Chinese Tartary. N. lat. 49° 38'. E. long. 126° 17'.

COUNA, or **COYNA**, a town of Portugal, in the province of Estremadura; 2 leagues S.S.E. of Lisbon.

COUNCIL, or **COUNSEL**, an assembly, or meeting of divers considerable persons, or officers, to consider and concert measures touching the administration of public affairs, rendering justice, or the like.

The king's councils are such as the law assigns him, in order to assist him in the discharge of his duties, the maintenance of his dignity, and the exertion of his prerogative. The *first* of these is the high court of parliament. See **PARLIAMENT**. *Secondly*, the 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, which hath been their principal use, when there is no parliament in being. See **PEERS**. A *third* council belonging to the king, according to sir Edward Coke (1 Inst. 110.), consists of his judges of the courts of law, for law matters. This appears frequently in our statutes, particularly 14 Edw. III. c. 5. and in other books of law. So that when the king's council is mentioned generally, it must be defined, particularized, and understood, "secundum subjectam materiam;" and if the subject be of a legal nature, then by the king's council is understood his council for matters of law; viz. his judges. Accordingly by the expression of the king's council in 16 Ric. II. c. 5. were understood the king's judges of his courts of justice, the subject-matter be-

ing legal: this being the general way of interpreting the word "council." 3 Inst. 125. But the *fourth*, and principal council belonging to the king, is his privy-council, which is generally called, by way of eminence, "the council." See **PRIVY COUNCIL**.

COUNCIL, *Aulic*. See **AULIC**.

COUNCIL, in *Church History and Polity*, a synod or assembly of prelates and doctors, and deputies, met for the regulation of matters, relating to the doctrine or discipline of the church. Mosheim observes (E. H. v. i. p. 107.) that the Christian churches, in the early period of their establishment, were entirely independent; none of them being subject to any foreign jurisdiction, but each one governed by its own rules and its own laws. For, though the churches founded by the apostles had this particular deference shewn them, that they were consulted in difficult and doubtful cases; yet they had no juridical authority, no sort of supremacy over the others, nor the least right to enact laws for them. Nothing, on the contrary, as he adds, is more evident than the perfect equality that reigned among the primitive churches, nor does there even appear, in the first century, the smallest trace of that association of provincial churches from which councils and metropolitans derive their origin. Although the meeting of the church of Jerusalem, mentioned in the 11th chapter of the Acts, is commonly considered as the first Christian council; yet this notion, as he conceives, arises from a manifest abuse of the word council. That meeting consisted only of one church; and if such a meeting be called a council, it will follow that there were innumerable councils in the primitive times. But every one knows, that a council is an assembly of deputies or commissioners sent from several churches associated by certain bonds in a general body, and therefore the term is inapplicable in the present instance. It has been generally supposed that the deliberations of the council at Jerusalem were suggested and directed by immediate inspiration; but others maintain that this kind of overruling interference would have superseded all reasoning and debates on the subject under consideration, and of course all difference of opinion. Although the members of this assembly conclude their advice to the Gentile Christians about the observance of the Jewish ceremonies, with saying that it seemed good to the Holy Ghost and to us, they probably only meant, as the advocates of the latter opinion allege, that they were fully persuaded that the regulations which they prescribed were proper in themselves, and therefore agreeable to the mind and will of God; being conscious to themselves that they were under no improper bias. When the apostles were dead, it was natural for the bishops of particular churches to assemble on similar occasions; and though they could not have the authority of the apostles, that office becoming extinct with those who were first appointed to it; yet, as there was no higher authority in the church, if they had contented themselves with merely giving advice, and confined their decisions to matters of discipline, they would hardly have been disputed. But it has been pretended, that *general councils*, consisting of bishops assembled from all parts of the Christian world, succeed to all the power of the apostles, and have even absolute authority in matters of faith.

During a great part of the second century, as well as the whole of the first, the Christian churches continued independent of each other; inasmuch, that, as Mosheim represents them, each Christian assembly was a little state, governed by its own laws, which were either enacted, or at least approved, by the society. But, in process of time, all the Christian churches of a province were formed into

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one large ecclesiastical body, which, like confederate states, assembled at certain times, in order to deliberate about the common interests of the whole. This institution had its origin among the Greeks, with whom nothing was more common than this confederacy of independent states, and the regular assemblies, which met at fixed times, and were composed of the deputies of each respective state. But these ecclesiastical associations were not long confined to the Greeks; as soon as their great utility was perceived they became universal, and were formed in all places where the gospel had been planted, (vid. Tertullian, *lib. de Iejuniis*, cap. 13.) To these assemblies, in which the deputies or commissioners of several churches consulted together, the name of "synods" was appropriated by the Greeks, and that of "councils" by the Latins; and the laws that were enacted, in these general meetings, were called "canons," *i. e.* rules. (See CANON.) These councils, of which, according to Mosheim, no trace can be found before the middle of the second century, gave a new form to the Christian church; for by them the ancient privileges of the people were considerably diminished, and the power and authority of the bishops greatly augmented. The prelates, at their first appearance in these general councils, acknowledged that they were no more than the delegates of their respective churches, and that they acted in the name, and by the authority, of their people. But the limits of their authority were soon extended, and they converted their influence into dominion, and their counsels into laws; and, at length, openly asserted, that Christ had empowered them to prescribe to his people "authoritative rules of faith and manners." These councils also gradually served to abolish that equality, which subsisted among bishops in the primitive times; because the order and decorum of these assemblies required, that some one of the provincial bishops, met in council, should be invested with a superior degree of authority and power; and hence the rights of Metropolitans derive their origin. (See METROPOLITAN.) Besides, the enlargement of the boundaries of the church, and the custom of holding councils which spring from it, occasioned the creation of a new order of ecclesiastics, who were appointed in different parts of the world, as heads of the church, and whose office it was to preserve the consistency and union of that immense body, the members of which were so widely dispersed throughout the nation. Such were the nature and office of the patriarchs (see PATRIARCH); among whom, at length, ambition formed a new dignity, investing the bishop of Rome, and his successors, with the title and authority of prince of the patriarchs. See BISHOP, CHURCH, and POPE.

COUNCIL, Provincial, is an assembly of the prelates of a province under the metropolitan. In these councils the provincial bishops deliberated together concerning those matters that related to the interests of the churches of a whole province, as also concerning religious controversies, the forms and rules of divine service, and other things of like moment. These lesser councils were composed of the ecclesiastical deputies of one or more provinces. See CONVOCATION and PROVINCE.

COUNCIL, National, is an assembly of the prelates of a nation, under their primate, or patriarch. See PRIMATE.

COUNCIL, Oecumenical or General, is an assembly of all the prelates of Christendom, or of commissioners from all the churches in the Christian world, and representing the church universal. Indeed to constitute a *general council*, it is not required, that all the prelates should be actually present; it is sufficient, that the *council* be regularly appoint-

ed, and that they may be there, or are summoned to attend.

General Councils are frequently called, by ecclesiastical authors, *plenary councils*. These were established by Constantine the Great, who assembled the first at Nice in 325.

This prince thought it equitable, that questions of superior importance, and such as intimately concerned the interests of Christianity in general, should be examined and decided in assemblies that represented the whole body of the Christian church; and his judgment in this respect was probably directed by that of the bishops. Indeed there never were any councils held, which could, with strict propriety, be called "universal;" those, however, whose laws and decrees were approved and admitted by the universal church, or the greatest part of the sacred body, are commonly called, however improperly, "oecumenical," or "general" councils. It is evident that no councils were entitled to this appellation in the strict sense of the term. For the four first, which are held in the highest estimation, had no bishops from several whole provinces in the Christian world; and the council of Trent, to the authority of which the papists pay such great deference, was perhaps the least respectable of all the councils. The chief intention of the crowned heads, who promoted this council, was to reform the abuses in the court of Rome. But the pope himself, by his legates presiding in it, pronounced the protestants, who appealed to it, heretics, before they were condemned by that council; and none were allowed to vote in it but such as had taken an oath to the pope and the church of Rome. There were scarcely 50 bishops present in it; none being sent from several countries. Some that attended were only titular bishops, created by the pope for that purpose; and some had Grecian titles in order to make an appearance of the Greek church consenting to it. It is also well known, that nothing was decided in the council without the previous consent of the court of Rome, and the decrees concluded with an express salvo of the whole authority of the apostolical see.

Councils were most frequent in the times of the Christian emperors at Constantinople, and of the Christian princes of Europe, from the fall of the Roman empire till towards the end of the 8th century. But the publication of the forged decretals of Isidore, at that period, produced a great change with respect to councils, the jurisdiction of bishops, and appeals: for councils became less frequent when they could not be held without the pope's leave; and the interruption of provincial councils, was a great wound, says Fleury, to ecclesiastical jurisdiction.

The Romanists reckon eighteen *general councils*: of which only the first four are admitted by the reformed. The number is made out thus: two of Nice, four of Constantinople, one of Ephesus, one of Chalcedon, five of the Lateran, two of Lyons, one of Vienne, one of Florence, and the last of Trent, which held from 1545 to 1563. The council of Trent ordains *provincial councils* to be held every three years; yet the last held in France is that of Bourdeaux, a hundred years ago.

The first person who seems to have maintained the infallibility of councils, is Barlaam; who exhorts one of his friends to return to the communion of the church of Rome, because a council at Lyons, being lawfully assembled, and having condemned the errors of the Greeks, he must then be considered as an heretic, cut off from the church, if he did not submit to it. But Occam, who lived at the same time, *viz.* in the 14th century, speaks of it as the opinion of some doctors only, while others say this infallibility was a privilege of the college of cardinals, and others of the pope himself.

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It was a question, however, that did not begin to be agitated till that time, and it was then disputed very calmly. It was more openly debated during the differences between the popes and the councils; when the councils setting themselves up above the popes, determined that *they*, and not the *popes*, were appointed by God to judge in the last resort concerning articles of faith. The council of Constance made no decision on the subject; but that of Basil did, saying that it was blasphemy to doubt that the Holy Spirit dictated their resolutions, decrees, and canons; while the pope, and his council at Florence, declared the contrary; and it is not yet determined which of these was a lawful council. (see Basnage, vol. iii. p. 518.) But if we consider the claims of infallibility in favour of these councils, we may argue, that an assembly of bishops, however numerous and respectable, being only an assembly of fallible men, can have no just pretensions to infallibility; nor, indeed, was this claim arrogated in early times. If the infallibility of general councils were admitted, it might be asked, what constitutes a *general council*? and how shall we know that it is truly *universal*? For this, it seems, is a necessary prerequisite to its infallibility. Were even all the Christian bishops admitted to the council of Nice? Were the Novatian bishops admitted there? No, says Valesius, they deserved to be shut out as schismatics. But they were orthodox in point of doctrine; and if we credit Socrates, the ecclesiastical historian, some of them had a plausible claim to admittance as they wrought miracles. Four hundred bishops met together at Ariminum; did they constitute a general council? No; it was an Arian council; and, therefore, it must not be called "concilium," but "conciabulum." Besides, those general councils, the decrees of which were most esteemed and most authoritative, were assemblies, in too great a degree, of factious men, who determined, not under the sole influence of a love of truth, but just as the emperors or the popes, who summoned them, were pleased to direct. Whoever duly considers the various motives by which the assembled prelates were influenced, will not be disposed to pay a blind deference to the authority of general councils, and will rather be inclined to judge that the council held by the apostles at Jerusalem was the first and the last in which the Holy Spirit may be affirmed to have presided. "Thus far we may safely go," says the excellent Dr. Jortin (Rem. on E. H. vol. iii. p. 57.) "and submit to an apostolical synod: but if once we proceed one step beyond this, we go we know not whither. If we admit the infallibility of one general council, why not of another? And where shall we stop? At the first Nicene council, A. D. 325, or at the second Nicene council, A. D. 787?" Although Arianism was condemned by the council of Nice, it was again established at the council of Ariminum, which was as much a general council as the other, and also in the councils of Seleucia and Sirmium. We have also a remarkable instance of the mutual contradictions of councils, at which the popes themselves have presided, in those of Chalcedon and Constantinople, in 554. For the former absolved and justified Theodoret of Cyr, and Ibas of Edessa, and received them into their body, as orthodox bishops; whereas the council of Constantinople, which is styled the fifth general council, and was approved by the pope, condemned them as damnable heretics. The council of Constantinople also decreed that images were not to be endured in Christian churches, whereas the second council of Nice not only allowed them to be erected, but even to be worshipped. In later times, the Lateran council of Julius II. was called for no other purpose but to rescind the decrees of the council of Pisa, and whereas the council of Basil had decreed that a council of bishops is above the popes, the Lateran council, under pope Leo,

decreed that a pope is above a council. "They who disclaim private judgment," says Dr. Jortin (*ubi supra*), "and believe the infallibility of the church, act consistently in holding the infallibility of councils; but they who take their faith from the Scriptures, and not from the church, should be careful not to require nor to yield too much regard to such assemblies, how numerous soever. Numbers in this case go for little, and to them the old proverb may be applied.

'Est turba semper argumentum pessimi.'

A general council, however, we are told, will at least be secured from erring in *fundamentals*; to which the same writer replies, that "by this way of reasoning the number of *fundamentals* will be increased beyond measure and without end; and *metaphysical terms of art* will be esteemed *fundamental doctrines*; as if the very essence of Christianity could depend upon words not used by the Holy Spirit, unknown to the sacred writers, not to be found in the records of the three first centuries, of which different interpretations were given when they were first established, and have been given ever since, and which common people most certainly do not and cannot understand; but they are secured, it seems, by that sort of faith without knowledge, which the church of Rome recommends, and which is called by some "*fides carbonaria*."

After all, we may observe, that the most eminent catholic writers themselves have maintained different opinions on this subject, and have been much influenced by the circumstances in which they wrote. This was very remarkably the case with Æneas Sylvius, who had with great boldness maintained the authority of the council of Basil against Eugenius IV.; but being made pope (by the name of Pius II.) he published a solemn recantation of all that he had written upon that subject, declaring without shame or hesitation, that as Æneas Sylvius he was a damnable heretic, but as Pius II. he was an orthodox pontiff. At present the opinion of the infallibility of the pope being generally given up by the catholics, they suppose the seat of infallibility (which must exist somewhere) to be in the councils. The protestants themselves had at one time no dispute about the authority of truly general councils. Luther appealed to a general council regularly assembled, and engaged to abide by its decision. Calvin maintained in express terms, that the universal church is infallible, and that God must annul his solemn promises if it be otherwise (Basnage, vol. iii. p. 499.) See also bishop Bull's Def. Fid. Nic.

Among protestants, at this advanced period of general illumination and liberty, no one will ascribe to any assembly of men, however dignified or numerous, the privilege of infallibility; nor will any one vindicate the imposition and credulity, which have frequently originated in this source.

There have been various collections of the canons or decrees of councils; as that of Dr. Merlin at Paris in 1524; one of F. Crabbe, a Franciscan, in 1536; another of Surrius, in 1567; another at Venice, in 1585; another at Rome, in 1608; one of Binus, canon of Cologne, in 1606, in ten volumes; another at the Louvre, in 1664, in thirty-seven volumes; another of F. Labbe and F. Cossart, Jesuits, in 1672, in seventeen volumes, more ample than the rest; lastly, another by F. Hardouin. See CAXON.

COUNCIL of the *Indies*, constitutes a tribunal, of very eminent dignity and extensive power, in which is vested the supreme government of all the Spanish dominions in America. It was first established by Ferdinand in the year 1511, and brought into a more perfect form by Charles V. in the year 1524. The jurisdiction extends to every department, ecclesiastical, civil, military, and commercial. All laws and ordinances relative to the government and police of the colonies

nies originate there, and must be approved of by two-thirds of the members, before they are issued in the name of the king. All the offices, of which the nomination is reserved to the crown, are conferred on this council; and to it each person employed in America, from the viceroy downwards, is accountable. It reviews their conduct, rewards their services, and inflicts the punishments due to their malversations. Before this tribunal is laid whatever intelligence, either public or secret, is received from America, and every scheme of improving the administration. From the first institution of the council of the Indies, it has been the constant object of the catholic monarchs to maintain its authority, and to make such additions from time to time, both to its power and its splendour, as may serve to render it formidable to all their subjects in the New World. Whatever degree of public order and virtue still remains in that country, where to many circumstances conspire to relax the former, and to corrupt the latter, may be ascribed in a great measure to the wise regulations and vigilant inspection of this respectable tribunal. Robertson's America, vol. iii.

COUNCIL of war, is an assembly of the principal officers of an army, or fleet, occasionally called by the general, or admiral, to consider of the present state of things, and concert measures for their conduct, with regard to sieges, retreats, engagements, &c.

The same term is sometimes also used for an assembly of the officers of a regiment or ship; met to try soldiers or sailors accused of any crime.

COUNCIL, Common. See *Mayor's Courts*.

COUNCIL and Session in Scotland. See *SESSIONS*.

COUNSEL, COUNSELLOR, Confiliarius, in Law; is a person retained by a client to plead his cause in a court of judicature.

Of counsellors there are two species or degrees; *viz. barristers and serjeants*; which see respectively. From both these degrees some are usually selected to be his Majesty's counsel, learned in the law; the two principal of whom are called his attorney, and solicitor, general. The first king's counsel, under the degree of serjeant, was sir Francis Bacon, who was made so "honoris causa," without either patent or fee; so that the first of the modern order (who are now the sworn servants of the crown, with a standing salary), seems to have been sir Francis North, afterwards lord-keeper of the great seal to king Charles II. These king's counsel answer in some measure to the advocates of the crown, "advocati fisci," among the Romans. For they must not be employed in any cause against the crown without special licence; in which restriction they agree with the advocates of the fisc (Cod. 2. 9. 1.); but in the imperial law the prohibition was carried still farther, and perhaps was more for the dignity of the sovereign; for, excepting some peculiar cases, the fiscal advocates were not permitted to be at all concerned in private suits between subject and subject. (Cod. 2. 7. 13.) A custom has of late years prevailed of granting letters of patent of precedence to such barristers as the crown thinks proper to honour with that mark of distinction; whereby they are entitled to such rank and pre-audience as are assigned in their respective patents;—sometimes next after the king's attorney general, but usually next after his majesty's counsel then being. These, as well as the queen's attorney and solicitor-general, rank promiscuously with the king's counsel; and, together with them, sit within the bar of the respective courts, but receive no salaries, and are not sworn; and therefore are at liberty to be retained in causes against the crown. And all other serjeants and barristers indiscriminately (except in the court of common pleas, where only serjeants are admitted), may take upon them the protection

and defence of any suitors, whether plaintiff or defendant. See *CLIENT*. As pre-audience in the courts is reckoned of so much consequence, we shall here subjoin the order of precedence, which usually obtains among the practisers: 1. The king's serjeant, so constituted by special patent:—2. The king's ancient serjeant, or the eldest among the king's serjeants:—3. The king's advocate general:—4. The king's attorney general:—5. The king's solicitor general:—6. The king's serjeants:—7. The king's counsel, with the queen's attorney and solicitor:—8. Serjeants at law:—9. The recorder of London:—10. Advocates of the civil law:—11. Barristers. In the court of exchequer two of the most experienced barristers, called the *post-man*, and the *tub-man*, from the places in which they sit, have also a precedence in motions. A counsellor at law hath a privilege to enforce any thing of which he is informed by his client, if pertinent to the matter, and is not to examine whether it be true or false; for it is at the peril of him who informs him. Cro. Jac. 90. And by stat. 5 Eliz. c. 14. counsellors shall not be punished for shewing a false deed in evidence. But after the court hath delivered their opinions of the matter in law depending before them, the *counsel* at the bar are not to urge any thing farther in that cause. 1 Lill. Abr. 355.

No counsel is allowed a prisoner upon a general issue, on indictment of felony, &c. unless some doubtful point of law arise; the court is the prisoner's only counsel; and the behaviour of the prisoner in his own defence, is one means of discovering the truth: but this seems to be a defect in our common law; which strictly is, in this respect, no part of our ancient law; for the Mirror (c. iii. § 1.), having observed the necessity of counsel in civil suits, immediately subjoins, that the necessity is greater in defence upon indictments and appeals of felony, than upon other venial causes. The judges themselves are so sensible of this defect, that they never scruple to allow a prisoner counsel to instruct him what questions to ask, or even to ask questions for him, with respect to matters of fact; for, as to matters of law, arising on the trial, they are entitled to the assistance of counsel. Provision is made by stat. 7 W. III. c. 3. and by stat. 20 Geo. II. c. 30. for counsel for prisoners in treason. See *TREASON*. Blackst. Com. vol. iv. See *TRIAL*.

COUNSELLORS of the king, hereditary. See *COUNCIL* and *PEERS*.

COUNSELLORS of honour. See *HONOUR*.

COUNSELLORS, Privy. See *PRIVY-COUNCIL*.

COUNT, COUNTEE, COMES, a nobleman who possesses a domain erected into a *COUNTY*; which see. See also *VISCOUNT*.

English counts we distinguish by the title of *earls*; foreign ones still retain their proper name.

The dignity of a count is a medium between that of a duke and a baron.

According to modern use, many plenipotentiaries and ambassadors have assumed the title of counts; though they have no county; as the *count d'Avaux*, &c.

Anciently, all generals, counsellors, judges, and secretaries of cities under Charlemagne were called *counts*; the distinguishing character of a *duke* and *count* being this, that the latter had but one town under him, but the former several.

A count has a right to bear on his arms a coronet, adorned with three precious stones, and surmounted with three large pearls, whereof those in the middle and extremities of the coronet advance above the rest.

Counts were originally lords of the court, or of the emperor's retinue, and had their name *comites, à comitando, or à comendo*: hence, those who were always in the palace or at the emperor's side, were called *counts palatine, or ac-*

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mites à latere. See *PAIATINE*.—In the times of the commonwealth, *comites*, among the Romans, was a general name for all those who accompanied the proconsuls and proprætors into the provinces, there to serve the commonwealth; as the tribunes, præfects, scribes, &c.

Under the emperors, *comites* were the officers of the palace. The origin of what we now call counts seems owing to Augustus, who took several senators to be his *comites*, as Dion observes, *i. e.* to accompany him in his voyages and travels, and to assist him with their advice in the hearing of causes; which were thus judged with the same authority as in full senate. These counsellors were styled “*comites Augustales*,” or “*comites Augusti*,” companions of the emperor, because they were constant attendants on his person. They were divided into three orders or degrees; and those of each order had certain privileges and appointments, while they attended the imperial court. As they had frequent access to the emperors, they often stood high in their favour, and obtained from them the government of provinces, towns, forts, and castles, and other offices of profit and honour. When they left the imperial court, to take upon them the government of a province, town, or castle, or the exercise of any office, they were no longer called “*comites Augustales*,” companions of the emperor, but “*comites*” of such a province, town, castle, or office, as the *counts* of Britain, of the Saxon shore, &c. Gallienus seems to have abolished this council, by forbidding the senators being found in the armies: and none of his successors re-established it.

These counsellors of the emperor were really *counts*, *comites*, *i. e.* companions of the prince; and they sometimes took the title, but always with the addition of the emperor's name whom they accompanied: so that it was rather a mark of their office, than a title of dignity.

Constantine was the first who converted it into a dignity; and under him it was that the name was first given absolutely.

When Constantine determined to separate the military from the civil administration, he transferred the supreme jurisdiction exercised by the prætorian præfects over the armies of the empire, to the two “*masters general*,” *magistri militum*, whom he instituted; the one for the cavalry, the other for the infantry; and though each of these *illustrious* officers, as they were denominated, was more peculiarly responsible for the discipline of those troops that were under his immediate inspection, they both indifferently commanded in the field the several bodies, whether of horse or foot, which were united in the same army. Their number was soon doubled, by the division of the East and West; and as separate generals of the same rank and title were appointed on the four important frontiers of the Rhine, of the Upper and the Lower Danube, and of the Euphrates, the defence of the Roman empire was at length committed to eight masters-general of the cavalry and infantry. Under their orders, 35 military commanders were stationed in the provinces; three in Britain, six in Gaul, one in Spain, one in Italy, five on the Upper, and four on the Lower Danube, in Asia eight, three in Egypt, and four in Africa. They were properly distinguished by the titles of “*counts*,” and “*dukes*,” the latter of which appellations, being a corruption of the Latin word *dux*, was indiscriminately applied to any military chief. All these provincial generals were therefore *dukes*; but no more than ten of them were dignified with the rank of *counts* or companions, as a title of honour, or rather of favour. A gold belt was the ensign which distinguished the office of the counts and dukes; and besides their pay, they received a liberal allowance, sufficient to maintain 190 servants, and 158 horses. They were strictly

prohibited from interfering in any matter which related to the administration of justice or the revenue; but the command which they exercised over the troops of the department was independent of the authority of the magistrates.

The name of count being once established was in a little time indifferently conferred, not only on those who followed the court, and accompanied the emperor, but also on most kinds of officers; a long list whereof is given us by Ducange.

Eusebius tells us, that Constantine divided the counts into three classes: the first bore the title of *illustres*: the second that of *clarissimi*, and afterwards *spectabiles*; the third were called *perfectissimi*.

Of the two first classes was the senate composed; those of the third class had no place in the senate, but enjoyed several other of the privileges of senators.

There were counts who served on land, others at sea; some in a civil, some in a religious, and some in a legal capacity: as, “*comes ærarii*, *comes sacrarum largitionum*, *comes sacri consistorii*, *comes curiæ*, *comes capelle*, *comes archiatrorum*, *comes commerciorum*, *comes velliarius*, *comes horrearum*, *comes opsoniorum*, *comes domestitorum*, *comes equorum regiorum* or *comes stabuli*, *comes domorum*, *comes excubitorum*, *comes notariorum*, *comes legum* or professor in jure, *comes limitum* or *marcarum*, *comes portus Romæ*, *comes patrimonii*, &c.”

Among those on whom Constantine conferred the rank of “*illustrious*,” we may mention the “*count of the camp*,” *comes castrensis*, to whom was committed the principal administration of public affairs. He was the supreme magistrate of the palace, inspected the discipline of the civil and military schools, and received appeals from all parts of the empire; the causes which related to that numerous army of privileged persons, who, as the servants of the court, had obtained, for themselves and families, a right to decline the authority of the ordinary judges. Another officer belonging to the same class was the treasurer-general of the revenue, denominated “*count of the sacred largesses*,” probably to inculcate the notion, that every payment flowed from the voluntary bounty of the monarch. Twenty-nine provincial receivers, of whom eighteen were honoured with the title of count, corresponded with the treasurer. The imperial estates, independently of the public revenue, were under the administration of another officer, called the “*count*” or treasurer of “*the private estate*.” Moreover, the chosen bands of cavalry and infantry, which guarded the person of the emperor, were under the immediate command of the “*two counts of the domestics*.” The whole number consisted of 3500 men, divided into seven schools, or troops, of 500 each; and in the east, this honourable service was almost entirely appropriated to the Armenians. These counts of the domestics had succeeded to the office of the Prætorian præfects; like the præfects, they aspired from the service of the palace to the command of armies.

The Franks, Germans, &c. passing into Gaul and Germany, did not abolish the form of the Roman government; and as the governors of cities and provinces were called *counts*, *comites*, and *dukes*, *duces*, they continued to be called so.

These governors commanded in time of war; and in time of peace they administered justice. Thus, in the time of Charlemagne, counts were the ordinary judges and governors of the cities.

These counts of cities were beneath the dukes and counts who presided over provinces; the first being constituted in the particular cities under the jurisdiction of the latter. The counts of provinces were in nothing inferior to dukes, who

who themselves were only governors of provinces. Under the last of the second race of French kings, they got their dignity rendered hereditary; and even usurped the sovereignty when Hugh Capet came to the crown: his authority was not sufficient to oppose their encroachments: and hence it is they date the privilege of wearing coronets in their arms; they assumed it then, as enjoying the rights of sovereigns in their particular districts, or counties. But, by degrees, most of the counties became re-united to the crown.

We learn from Tacitus, that the chief men among the Germans endeavoured to attach to their persons and interests certain adherents, whom he calls "Comites." These fought under their standard, and followed them in all their enterprises. The same custom continued among them in their new settlements, and these attached or devoted followers were called "fideles," "antrustiones," "homines in truste Dominica," and "leudes." Tacitus informs us (De Mor. Germ. c. 13.) that the rank of "a comes" was deemed honourable; and the composition paid for the murder of one "in truste dominica" was triple to that paid for the murder of a freeman. While the Germans remained in their own country, they courted the favour of these "comites" by presents of arms and horses, and by hospitality. As long as they had no property in land, these were the only gifts which they could bestow, and the only reward which their followers desired. But upon their settling in the countries which they conquered, and when the value of property came to be understood among them, instead of these slight presents, the kings and chieftains bestowed a more substantial recompense in land on their adherents. These grants were called "beneficia," because they were gratuitous donations; and "honores," because they were regarded as marks of distinction. See BENEFICIUM.

The quality of count is now become very different from what it was anciently; being now no more than a title, which a king grants upon erecting a territory into a county, with a reserve of jurisdiction and sovereignty to himself.

At first, there was no clause in the patent of erection, intimating the reversion of the county to the crown in default of heirs male; but Charles IX., to prevent their being too numerous, ordained that duchies and counties, in default of heirs male, should return to the crown.

The point of precedence between counts and marquises has been formerly much controverted; though anciently, when counts were governors of provinces, they were on a level even with dukes.

William the Conqueror, as is observed by Camden, gave the dignity of counts in fee to his nobles; annexing it to this or that county or province, and allotting for their maintenance a certain proportion of money, arising from the prince's profits in the pleadings and forfeitures of the provinces. To this purpose he quotes an ancient record, thus, "Hen. II. Rex Angliæ his verbis *comitem* creavit; sciatis nos fecisse Hugonem Bigot *comitem* de Norf. &c. de tertio denarii de Norwich & Norfolk, sicut aliquis *comes* Angliæ, &c.

The Germans call a count, *graf*, or *graff*; which, according to a modern critic, properly signifies *judge*; and is derived from *gravis*, or *graffio*, of *γράφω*, *I write*. They have several kinds of these counts, or *graffs*; as *landgraves*, *marchgraves*, *burg-graves*, and *palsgraves*, or *counts palatine*. These last are of two kinds; the former are of the number of princes, and have the investiture of a palatinate; the others have only the title of *count palatine*, without the investiture of any palatinate.

Some assert, that by publicly professing the imperial laws for twenty years, the person acquires the dignity of a *count palatine*; and there are instances of professors in law, who have assumed the title accordingly; but there are others who question this right.

COUNTS of Britain, "Comites Britanniarum," officers who commanded the Roman forces in the interior parts of Britain, distributed into the towns, forts, and castles in these parts. The forces under the counts of Britain are supposed to have been originally about 3000 foot and 600 horse; but after the internal tranquility of the country was fully secured, these forces seem to have been removed out of the island, or to have been stationed on the frontiers; for in the 53d section of the "Notitia Imperii," where the court of this count is described, no notice is taken of any forces under his command.

COUNT of the Saxon shore in Britain, "Comes littoris Saxonici per Britanniam," an officer who commanded in chief all the forts and garrisons, established along the south and east coasts of Britain, in order to protect the country from the depredations of Saxon pirates, who infested these coasts. Of these forts there were nine in the following order, beginning at the most northerly, and advancing southwards: *viz.* 1. Branodunum, or Brancaster;—2. Gariononum, Burghcastle, near Yarmouth; both on the Norfolk coast;—3. Othona, Ithanchester, not far from Malden in Essex; now overflowed by the sea;—4. Regulbium, Reculver;—5. Rutupæ, Richborough;—6. Dubris, Dover; 7. Lemnæ, Lime; these four last on the coast of Kent;—8. Anderida, Hastings, or East-Bourn, in Suffex—and 9. Portus Adurnus, Portsmouth, in Hampshire. These 9 forts were garrisoned by about 2200 foot, and 200 horse. The ensigns of the count of the Saxon shore in Britain were, a book of instructions, and the figures of 9 castles, representing the 9 forts under his command. The court of this count was composed of the following officers; *viz.* A principal officer from the court of the master of the foot; two auditors and a master of the prisons, both from the same court; a secretary; an assitant; an under-assitant; a register; clerks of appeals; serjeants; and other under-officers.

COUNT, in Law, denotes the original declaration of complaint in a real action; as the declaration is in a personal one; the libellus of the civilians answers to both.

Yet, count and declaration are sometimes confounded; and used for each other: as, *count in debt*, *count in appeal*, &c. See DECLARATION.

COUNT-wheel, in Clock-work, a wheel which moves round in twelve hours; called also the *locking-wheel*. See CLOCK.

COUNTEE, Fr. *Comte*, denoted the most eminent dignity of a subject, before the conquest; so that those, who in ancient times were created "Countees," were men of great estate; for which reason, and because the law intends that they assist the king with their counsel for the public good, and preserve the realm by their valour, they had great privileges; as that they might not be arrested for debt or trespass, or be put upon juries, &c. Of old the countee was *præfatus*, or *præpositus comitatus*, and had the charge and custody of the county (which fee); but this authority now belongs to the sheriff. 9 Rep. 46. A countee or count is in the law French, an earl. See EARL.

COUNTENANCE, seems to have been used for credit or estimation; Old Nat. Brev. III. and stat. 1 Ed. III. c. 4. See CONTENTMENT.

COUNTER, from *computare*, is the name of two prisons in

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in London, for the use of the city, to confine debtors, breakers of the peace, &c.

COUNTER, among *Engineers*, is a term often used for the over-looker upon canals and other great works, whose business it is to count the men employed at different times of the day, and keep an account of the time and number of labourers' days-work, spent on different departments of the work, both as a check upon the charge of such men as are paid by the day, and as a rule for the sums which contractors for large pieces of work, are to be allowed to draw, on account, for paying their men: this information is also of the most essential use in forming the resident engineer's judgment on the time necessary for performing any future piece of work, and the proper prices to be allowed for works of different kinds, as observed under the article CANAL, which see.

COUNTERS, in *Ship-Building*, are distinguished into *upper* and *lower*. The *upper counter* is reckoned from the gallery to the lower part of the straight piece of the stern. The *lower counter* is between the transom and lower part of the gallery.

COUNTER of a *horse*, that part of a horse's fore hand which lies between the shoulders and under the neck.

COUNTERS, Fr. JETTONS, from *jetter*, to cast, in the *History of Coinage*, are pieces of coin issuing from modern mints that frequently occur; they are small, and very thin, commonly of copper or brass, but sometimes of silver, and even of gold. The intention of the common counters, as their name imports, was merely for calculation. This was performed by means of a board marked with parallel lines. (See ABACUS.) Pieces of this kind were most commonly used in abbeys and other places, where the revenue was complex and difficult of adjustment. For this reason, a great number of them is found in the ruins of our English abbeys, whence they are commonly called "Abbey-pieces." But almost all of them are coined abroad, from the 14th century down to the present times; though some few have been likewise struck in England, from the time of Henry VIII. downwards. Most of the gold and silver counters are within the last century, and struck in France. They are readily known from the arms of the companies on them, and from other marks, so that it is needless to give any particular account of them. The English "touch-pieces" may be classed with silver counters; they commonly bear on one side St. Michael and the dragon, and a ship on the other; and they were designed to be hung round the neck when the king touched the party for the evil: the latest are of James II., Anne, and the Pretender. The ancient copper counters are the most likely to impose upon the younger amateurs in the science of medals; who may be so imposed upon as to pay for them as coins, though they are not worth a penny a piece. Mr. Snelling has, in his treatise, given plates of them of all ages; in which it will be seen, that the most ancient have crosses with pellets on both sides, and similar devices; the next, globes surmounted by crosses, &c.; and the most modern, portraits of princes and dates, with the arms of the kingdoms on the reverse. Besides, they are easily distinguished by their thinness, which degrades them from all other coin; for, as medals are superior to coin, so counters of all kinds are inferior. The ancient ones cannot impose on any person; for copper was coined for currency in France, and other countries where they are principally struck, till about the year 1580; and brass never was common coin of any state in modern times. The modern counters have almost always a legend in Latin, French, or Flemish, which marks their intention; being so many maxims of justice in accounts.

The ancients had counters of the small brass fort, that were struck for their domestic games; e. g. that with four dyes, QUI LUDET ARRAM DET QUOD SATIS SIT, and the like: a dafs, says Pinkerton, that has hitherto totally escaped our metallists. In this connection we may mention the "Nummi bracteati," (see BRACTEATED) a species of the early modern coins between counters and money. They are small thin plates, commonly of silver, stamped with wooden dyes, as it should seem, upon one side only, with the rude impression of various figures and inscriptions. Most of them are ecclesiastical, as appears from the cross, &c. being struck by the archbishops, bishops, and abbots, in Germany, Switzerland, Denmark, Sweden, Norway, and a few in Poland. But some also occur of secular princes and states. Sperlingius has published a curious treatise on the origin and progress of bracteate coins, (Lubec, 1700, 4to.) from which it appears that the oldest are of Henry the Lion, duke of Saxony, 1180; and it is certain they were unknown in Germany till that century. There are several bracteate coins of the counts of Thuringia, bearing their figures on horse-back, with legends of name and title. The Byzantine base silver, in the form of a cup, with figures only on the concave side, seems to have given rise to the German bracteate coins. And they continued to be used in Germany till the end of the 15th century; and in some parts of Switzerland they are used even now; though at Zurich they ceased about the year 1400. There are many of bishops in Denmark, as of Sueno, 1370, and others; as there are of Swedish bishops; and of Norwegian, which last bear NI for Nidaros, now Drontheim, the archiepiscopal see. Some opulent trading towns in Norway also appear to have struck them; and A occurs for Aflua, or Opflua, and B for Bergen, as Sperling explains them. Those of German cities and states, are mostly known by the arms. Pinkerton's *Ess. on Medals*, vol. ii.

COUNTER, of the Latin preposition *contra*, against, is used in the composition of divers words in our language; and generally implies the relation of opposition, as,

COUNTER-Alley, in *Gardening*. See ALLEY.

COUNTER-Approach. *Line of counter-approach*, is a sort of trench, which the besieged make from their covert-way to the right and the left of the attacks, in order to be able to enfilade the enemy's works. This line should take its commencement, or begin, in the angle of the place of arms of the ravelin, that is not attacked, and of the bastion attacked, at the distance of 50 or 60 toises from the attacks; and ought to be prolonged, or carried on as far as may be judged necessary for seeing the enemy in his trenches and parallels. This line or trench, ought to be completely commanded, and seen directly from the covert-way and ravelin, to prevent the besiegers, should they drive the troops out of it, to derive any benefit or advantage from it.

There should be placed on each side of the opening of this line of counter-approach, small pieces of artillery, and in the demi-lune, or ravelin directly opposite to the said opening, some large cannon to scour and look along it, should the enemy wish to establish himself in it after drawing the besieged out of it.

The enemy will either endeavour to cover himself against this line of counter-approach, or he will push on a line to join it, expecting to render it useless. But such a line, if he makes it, will render his cavalry of but little use against the sallies of the besieged. Besides, another line of counter-approach more distant from the attacks, and more extended, will produce the same effect with the first, and will render the first useful for the purpose it was intended for,

before

before the enemy made such a junction with it. For the fire from this second line of counter-approach will see in flank and in the rear the line of junction, which, being seen, will become useless to the besiegers and favourable to the besieged.

If the besiegers' trenches are in right lines, that cannot be enfiladed from the works of the places, and are secured only by redoubts from distance to distance, the lines between these redoubts will assuredly be seen by the line of counter-approach, and of course will be bared to view and discovered. And if the enemy make, besides these redoubts, large places of arms, the only remedy is to attack them in front, and with a quantity of grenades, whilst the troops commanded to attack them charge them in flank, and the cannon and musketry of the place keep up a constant fire on the redoubts.

COUNTER-Bande, or *Contre-Bandé*. By this term the French express what we term *Bendy of six per bend sinister counter-changed*.

COUNTER-Barry, or *Contre-Barre*, is used by the French heralds for what we more ordinarily call *bendy sinister per bend counter-changed*. See **BARRY**.

COUNTER-Battery is, strictly speaking, a battery directed against another battery, in order to dismount the guns in it, and destroy it. This term, however, is commonly given to a battery, which the besieged oppose to a battery of the besiegers, in order to ruin it, particularly when he gets pretty near to the counterscarp of the great ditch, and is erecting batteries for the purpose of destroying the flanks, and dismounting the guns on them.

COUNTER-Bendy. See **COUNTER-Bande**.

COUNTER-Bond, is a bond given to save a person harmless, who has given his bond for another. This is also called *counter-security*.

COUNTER-Bracing. See **TACKING**.

COUNTER-Braeswork, in *Fortification*, denotes a *Fausse-braye*; which see.

COUNTER-Cartelé, or *Contre-cartelé*, in *Heraldry*, the French term for *counter-quartered*, or *quarterly-quartered*; that is, when the grand quarterings are quartered.

COUNTER-Change, in *Commerce*, a mutual exchange between two parties. See **EXCHANGE**.

COUNTER-Changed, in *Heraldry*, is when there is a mutual changing of the colours of the field and charge in an escutcheon, by means of one or more lines of partition. Thus, the coat of the celebrated Chaucer, is "Party per pale argent and gules a bend counter-changed," that is, that part of the bend which is on that side of the escutcheon which is argent is gules; and that part of it which is on the other is argent.

COUNTER-Charge, is a reciprocal charge, or recrimination, brought against an accuser. See **RECRIMINATION**.

COUNTER-Charm, a charm, or spell, contrived to hinder the effect of another. See **LIGATURE**.

COUNTER-Cheveronné, in *Heraldry*, denotes a field divided cheveronways, and is now more frequently termed *per Cheveron*.

COUNTER-Coloured. See **COUNTER-Bande**.

COUNTER-Componé. See **COMPONÉ**.

COUNTER-Deed, a secret writing, or a private act, either before a notary, or under a privy-seal; which destroys, changes, annuls, or alters, some more solemn and public act.

Counter-deeds are rather tolerated than permitted: in many cases they are actually prohibited; as being usually no

better than frauds. The custom of Paris annuls all counter-deeds, contrary to the tenor of a marriage.

COUNTER-Drain is a ditch or channel, parallel to a canal or embanked water-course, for collecting the soilage water, or for conveying any brook or stream of water by the side of the canal or embankment, to a culvert or arch under the canal, by which it is to be conveyed away to lower ground.

COUNTER-Drawing, in *Painting*, &c. the copying of a design or painting, by means of a fine linen cloth, an oiled paper, or other transparent matter; whereon the strokes appearing through, are followed and traced with a pencil, with or without colour.

Sometimes they counter-draw on glass, and with frames or nets divided into squares, with silk, or with thread; and also by means of instruments invented for the purpose, as the parallelogram. See **DESIGNING**.

COUNTER-Embattled, in *Heraldry*. When an ordinary is embattled counter-embattled, the indents on the upper edge must answer the projections on the under.

COUNTER-Ermined, is the reverse of ermine, being a black shield with white spots; and is now generally termed *Ermines*. See **ERMINE**.

COUNTER-Extension, in *Surgery*, is the act of stretching or drawing a limb in a direction contrary to that which is required for its reduction, when fractured or dislocated; so that the patient cannot be pulled along by the force employed *ab extra*. Thus, if a surgeon pulled at the arm, to reduce a luxated shoulder, he would require one or more persons to hold the body of the patient steady, which would be employing counter-extension; or, if the surgeon were to pull at a dislocated finger, an assistant holding the wrist or fore-arm would produce counter-extension.

COUNTER-Faced, or *Contre-facé*, is a French term, expressed by the English heralds by *Barry per pale counter-changed*; always mentioning the number of bars the field is divided into.

COUNTERFEIT MEDALS. See **MEDALS**.

COUNTERFEITING the King's Coin and Seals. See **TREASON**.

COUNTERFEITS, in *Law*. See **CHEATS**.

COUNTER-FISSURE, a *Surgical* term, denoting a fissure or fracture, produced by a blow or fall, in a part of the body (suppose the occipital bone) quite remote or even opposite to that which had received the mechanical violence. This accident may happen in many parts, but especially the head, where it is the most dangerous of all.

Counter-fractures or counter-fissures of the head, are taken notice of by Celsus, but denied to exist by Paulus Ægineta. Those of the head are of different kinds. The external table sometimes remains whole at the part to which the violence has been applied, whilst the internal one is fractured; sometimes that part of a bone of the cranium which has received the blow remains entire, whilst another at its side is fractured; sometimes the bone to which violence has been applied remains entire, whilst the neighbouring one is fractured; and sometimes the fracture appears in the bone directly opposite to that which has received the blow. Sometimes, also, both the bone that has received the blow, and that directly opposite, are fractured at the same time. Sometimes a single blow produces several counter-fissures in different places.

A counter-fissure produced without any lesion of the neighbouring parts, that is, without extravasation, inflammation, suppuration, &c. is a very trifling circumstance,

which gives rise to no bad consequences, and exhibits no particular symptoms by which it can be discovered; neither is it necessary that it should be discovered. Very rarely, and only when the counter-fissure is extremely large, can it be felt through the integuments. The external swelling and redness over the fissure generally appears very late, or not at all: and probably only when the external violence has acted immediately upon the part, so that it is properly no counter-fissure. In general, all other symptoms of a counter-fissure are uncertain. Besides that, the parts in the vicinity of a counter-fissure are far more rarely affected at the same time, than in fractures of the cranium; and, consequently, any very minute examination is seldom required.

In one particular case, a fracture, or even counter-fracture, requires the operation of the trepan; that is, when the inner sharp and rugged margin of the fissure, or a splinter of the inner table of the cranium, presses upon and irritates the dura mater. The surgeon may suppose this circumstance to exist, when, in a case of fracture without depression, spasms and convulsions come on soon after the violence has been inflicted, and the patient is in complete possession of his senses; and in these cases he may apply the trepan. Sometimes the consequence is an inflammation of the dura mater, which is distinguished by its peculiar symptoms, and requires a peculiar method of treatment. This circumstance may also happen in counter-fissures. When inflammation comes on, we may possibly discover the situation of the counter-fissure by the topical inflammatory symptoms; but this will be much more difficult if it only produces spasms and convulsions, unless perhaps the local sensations of the patient may tend to point it out. The same circumstance may also take place when the external table is entire, and only the internal one fractured. The diagnosis and treatment in this case are the same as in the preceding. To suppose a fracture of the internal table, whenever there is a depression at the place to which the external violence has been applied, is probably erroneous.

The lower extremities are liable to counter-force, in consequence of falls upon the legs, and in leaping; and the same circumstances may also occasion counter-force in some parts of the pelvis, which may produce various irregularities in the system. The superior extremities are liable to counter-force, when a person falls down whilst he is walking, or from a height, and thrusts out his hands or elbows to receive the shock. The consequences of such counter-force are various: it may produce dislocations, twirlings, separation of the bones, contusions in the joints, separation of the os sacrum from the ossa innominata, laceration of the ligaments, &c.

COUNTER-Foil, or *Counter-Stock*, is that part of a tally, struck in the exchequer, which is kept by an officer of the court.

COUNTER-Forts, are bodies of masonry built behind walls, from distance to distance, and joined to, or cemented with, them, in order to strengthen them, and lessen the pressure of the earth behind them. In fortification, there are commonly 18 feet between the centre of one counter-fort and another.

COUNTER Fugue, in *Music*, is when fugues proceed contrary to one another.

COUNTER-Gage, in *Carpentry*, a method used to measure the joints, by transferring, *v. gr.* the breadth of a mortise to the place in the timber where the tenon is to be, in order to make them fit each other.

COUNTER-Guard, in *Fortification*, is a work composed of two faces, forming a salient angle, which is in the capital of

the bastion or of the ravelin produced, according as it is placed before the one or the other; for it is sometimes placed before both. When it is placed before the bastion, however, it is supposed to be a work of good defence.

COUNTER-Harmonical. See *CONTRA-Harmonical*.

COUNTER-Indication. See *CONTRA-Indication*.

COUNTER-Irritation, in *Surgery*, is the effect occasioned by any irritating application on a part at some distance from that which is diseased; *e. g.* in an inflammation of the eye, a counter-irritation is produced by applying a blister behind the ear; or, if the vital parts be affected by gout, a counter-irritation may be excited on the foot by friction with any stimulating substance, or even by bathing the foot in hot water, &c. Again, if there be signs of oppression upon the brain, a strong vesicatory applied to the neck may produce a counter-irritation, and relieve the patient. In all these cases, there is not merely a local stimulus or nervous excitement produced in the part, attended with an increased sensibility, but there is also an increased action of the blood in the part which is irritated, as appears by redness and heat of the skin.

COUNTER-Light, a window, or light, opposite to any thing, which makes it appear to a disadvantage. A single counter-light is sufficient to take away all the beauty of a fine painting.

COUNTER-Line, the same as *CONTRAVALLATION*; which see.

COUNTERMAND, in a general sense, a revocation of an order; or an excuse for setting aside, or deferring, a thing ordered to be done.

By the French law, a countermand differs from an *essoin*, 1. In that, in the countermand, the consignment is proposed to be deferred to a day certain, which is not in the *essoin*. 2. In the *essoin*, the cause of deferring the consignment is expressed, and affirmed to be true; but in a countermand that affirmation is not required.

COUNTERMAND, in the *English Law*, is where a thing, formerly executed, is afterward, by some act or ceremony, made void by the party that first did it.

This is either actual, by deed; or implied: *actual*, where a power to execute any authority, &c. is given by a formal writing, for that very purpose put off for a time, or made void; and *implied*, where a man makes his last will, and devises his land to T. S., and afterwards enfeoffs another of the same land: this feoffment is a countermand to the will, without any express words for the same, and the will is void as to the disposition of the land. Also, if a woman, seized of land, in fee-simple, makes a will and deviseth the same to C. D. and his heirs, if he survive her; and after the intermarries with the said C. D.: in this case, by taking him to husband, and coverture at the time of her death, the will is countermanded. *Terms de Ley*. But if a woman makes a lease at will, and then marries, this marriage is no countermand to the lease, without express matter done by the husband to determine the will. A person may countermand his command, authority, licence, &c. before the thing is done; and if he dies, it is countermanded. There is also a countermand of notice of trial, &c. in law proceedings.

COUNTERMAND, or **COUNTER Order**, in the *Detachments*. When the troops commanded, although on a march, are countermanded, the service of the detachments is accounted performed, and they go to join their respective corps.

To *countermand* is also to issue contrary orders to those already given; to contradict or forbid the execution of former orders, &c.

COUNTER-

COUNTER-MANDATE. See **CONTRAMANDATUM.**

COUNTER-March. This is when an army, a regiment, or a detachment, performs a march different from what it originally intended. This is what is called a counter-march, in the strict sense of the word. This appellation is also given to a change of the wings or of the face of a battalion, by which the men who were on the right, or in the front, take up the ground originally occupied by those on the left or in the rear.

COUNTER-Mark, a second or third mark, put on any thing marked before.

The word is applied, in commerce, to the several marks put on a bale of goods belonging to several merchants; that it may not be opened but in the presence of them all, or their agents.

In goldsmith's works, &c. the counter-mark is the mark or punchion of the hall, or company, to shew the metal is standard, added to that of the artificer who made it.

Counter-mark of a horse, is an artificial cavity, which the jockeys make in the teeth of horses that have out-grown the natural mark; to disguise their age, and make them appear as if they were not above eight years old.

Counter-mark of a medal, is a mark added to a medal, a long time after its being struck.

Counter-marks appear to be faults, or flaws, in medals, disfiguring the ground, sometimes on the side of the head, and sometimes on the reverse; particularly in the large and middle-sized brass: yet they are esteemed as beauties among the curious, who set a particular value on such medals, because they know the several changes in value they have undergone, which are expressed by those counter-marks; as was the case with the counter-marked coins of Henry VIII. and of Mary of Scotland, in modern times. They are also very rare.

Antiquaries, however, are not well agreed about the signification of the characters they find on them. On some, N. PROB. on others, N. CAPR. on others, CASR. RM. NT. AUG. SC. Some have, for their counter-mark, an emperor's head; some several; some a cornucopia.

Care must be taken not to confound the monograms with the counter-marks: the method of distinguishing them is easy. The counter-marks, being struck after the medal, are dented, or sunk in; whereas the monograms, being struck at the same time with the medals, have rather a little relieve.

COUNTER-Mines, subterraneous excavations or cavities, made by the besieged, to counteract and render useless the besieger's mines, which are hollows or cavities that they make under those places, which they intend to blow up with gunpowder. The distinction, then, between mines and counter-mines consists in this, that the first are made by the besiegers, and the last by the besieged. Both mines and counter-mines, however, are made in the same manner, and for the same purposes; namely, to blow up their enemies, their batteries, and works. But the principal galleries and mines of the besieged are commonly made before the place is invested, and frequently at the time the fortifications or works themselves are erected, in order to save expence; whereas all the mining operations of the besiegers are commenced and carried on after the investiture. Writers on mining are generally apt to express themselves in terms rather loose, taking into the definition of a mine or counter-mine the passage under ground leading to it, and part of the communications, if it communicates with other mines or counter-mines. A mine or counter-mine, however, strictly speaking, is the hollow or cavity which is made or excavated under the place intended to be blown up, and where

the quantity of powder, necessary for producing the proposed effect, is placed or lodged. This hollow, or cavity, is usually called by them the *chamber*, or *fourneaux*; and the passage leading to it, the *gallery*. The perpendicular distance from the centre of the chamber, or place where the powder is lodged, to the nearest surface of the ground, is called the *line of least resistance*.

The pit or hole, made by the springing of a mine or counter-mine, is called the excavation.

The fire is communicated or conveyed to mines or counter-mines by means of a pipe or hose, made of coarse cloth, the diameter of which is about an inch and a half, called *saucisson*, extending from the chamber to the entrance of the gallery, where there is fixed a match to the end of it, in order that the miner, who sets fire to the powder contained in it, may have sufficient time to retire before the match is burnt up to the powder.

In order to prevent the powder from contracting any dampness, the *saucisson* is laid in a small trough, called *auge*, about $3\frac{1}{2}$ inches broad, and made of boards joined together lengthways, with shaw in it, and a wooden cover nailed upon it at top.

For filling this pipe that conveys fire to the mine or counter-mine, about half a pound of powder is usually required for every foot of it in length. The exact quantity, however, depends on the size or diameter of the *saucisson*. The *saucissons* are generally tarred.

The besieged commonly make a great many small mines under the glacis, of about six, seven, or eight feet deep only under ground, which are called *fougates*, or *fougasses*. They also make what are called *coffers*, or *caissons*, which are a kind of barrels or boxes, from three to four feet long, and from a foot to eighteen inches wide, which they place four, five, or six feet under the surface of the glacis, and about four yards distant from one another.

The whole art of mining and counter-mining depends on the four following operations or particulars:

1st. The making of the galleries and the *fourneaux*, or chambers; and the securing of the earth against falling in, by means of wooden frames and props.

2dly. In the loading and the stopping up of the mines or counter-mines, in such a manner as to be ready for springing when necessary.

3dly. In knowing the proper charges for mines or counter-mines, placed in different soils, and at different depths under the surface of the ground, in order that the effects arising from the springing of them may answer the intentions or purposes for which they were made.

Lastly. In carrying on the galleries, according to given directions and to given length, in such a way as to place the *fourneaux*, or chambers, directly under the objects intended to be blown up, and at the proper depths under ground. For these particulars, see the article **MINE**.

Anciently a counter-mine was a vault made and prepared in the earth, or rampart of the *enceinte* of a place, behind the wall. Such counter-mines, however, are at present rejected, because of the conveniencies for the miners of the besiegers to make their mines.

A counter-mine, in a bastion, should be joined by several small channels or branches, which ought to traverse the earth of the bastion in such a manner, that on whatever side the besieger's miner opens the ground, or the wall, he sees every where openings and chimneys, capable of giving vent to his powder, and preventing its intended effects. It is by means of such openings, which reach quite to the foundations, and have vents and air-holes behind, that the besieger's miners are often destroyed; and the powder they

C O U N T E R - M I N E S .

place in their mines is wetted or moistened with water, and rendered useless.

There are two sorts of counter-mines. Those of one sort are made at the time the place is built or constructed: these are arched or vaulted galleries, about six feet high and from three to four feet broad, and are called *galeries majeures*. The other counter-mines are made in time of a siege, and people go along them on their knees, or at least stooping, and they are called channels, branches, or *rameaux*.

The counter-mines of the body of a place are made under the terre-plain of the rampart, on a level with the bottom of the ditch. The entrances to them are by the gorges of the bastions. They are about ten feet distant from the revetement, to which they are parallel, and with which they communicate, by means of *rameaux*, from distance to distance. These *rameaux* are of the same materials, and in the same proportions, as the *galeries majeures*.

From the counter-mines of the place one descends into the caponics, and then ascends from these into the counter-mines of the covert-way, from which *rameaux* are carried towards the field, that serve, in time of a siege, for making *fourneaux*, or small mines, which blow up the works of the besiegers, and retard their approaches.

In order to discover the besieger's mines, *casicans*, wells, or pits, are made obliquely in the ground, where a miner is suspected to be at work; and when these wells or pits are judged to be lower than the besieger's mines, little heads or channels are driven in every direction, to find the enemy's mine, or to enclose it and render it useless, by giving vent to it; cutting the train, to prevent him from springing it; taking the powder away, or spoiling it, by pouring a quantity of water on it or round it.

These heads should be driven perpendicularly to the capital of the bastion, when you suppose or apprehend there is a mine in or near its salient angle, and parallel to the face, if you are fearful there is a mine in it; and if the ditch be dry, they should be driven under the bottom of it, as the enemy may then have a gallery under it also.

We know from different writers and historians, that the ancients made mines to surprise towns, and throw down their walls. We have every reason, therefore, to believe, that they also had methods for discovering them. And Vitruvius, in the last chapter of his last book, informs us, that the inhabitants of Marseilles, when it was besieged, suspecting the enemy of carrying mines under the ditch, dug it deeper all round the town, and thereby discovered under the ditch the avenues or galleries of thirty mines, which the besiegers had prepared for surprising them.

Counter-mines both have been, and may be, made use of to great advantage in the defence of places, from the moment the besiegers approach the foot of the glacis.

As in the course of time, during a siege, the besieged will find it necessary to retire from advanced or out-works, and leave them in the hands of the enemy; whether the besiegers render themselves masters of them by force or by sap, they ought to make in them a quantity of small *fourneaux*, to which they may set fire in retiring, and by means of them destroy the besieger's lodgments and works.

They should have a number of *fourneaux* under the glacis, to be made use of in time of need or necessity. These will destroy the besieger's works in his whole progress through it, unless, seeing his first labours overturned and taken, and apprehending similar accidents, he do not carry his lodgment to the crest of the glacis, but content himself with the surrounding of it by sap, and, by means thereof, with giving vent to the *fourneaux*; which, though a tedious method of proceeding, is the safest and surest one he can adopt. But

if the ditch be dry, though he may give vent to the *fourneaux*, or small counter-mines, that have been made under the glacis, the lodgments which he makes a-top of it will not be secure against the effects of other counter-mines: for the besieged can make counter-mines under these *fourneaux*, that vent has been given to; and these counter-mines, when sprung, will be attended with more dangerous and surprising effects, as they will do more execution, and the snare will be less expected. A sally or sortie made by the besieged, at the time of springing them, will increase the surprise, astonishment, and confusion of the enemy.

There is one essential circumstance to be attended to in the construction of counter-mines, which is to guard against their producing the effect, when sprung, of throwing any part of the covert-way into the ditch, instead of overturning the adjoining lodgment of the enemy, and the sap, which he may have commenced for his descent into the ditch. For this reason, care should be taken to keep the chamber of the counter-mine farther from the counterscarp, or exterior side of the ditch, than the perpendicular height of the earth above it, which it has to raise or throw up.

It is not necessary to wait till the besiegers have made their lodgments across the glacis, to annoy and disquiet them by means of counter-mines, unless it be well known and ascertained that they are not descending, or making excavations under ground, for the purpose of giving vent to the subterraneous works that may have been prepared by the besieged. In this case, the besieged ought even to amuse them as much as possible, by disputing with them their lodgments. But after they shall suppose that they have well established the head of their trench, and their lodgments, the besieged should blow them up, by means of *fourneaux* and counter-mines, and also overthrow, if possible, the place of arms which they may have made for the security of their advanced works, and thereby oblige them to look for that security under ground which they cannot find above it. Thus they would be forced to make a number of subterraneous works, to which the besieged ought to oppose themselves, by means of intersecting branches or *rameaux*, which have all of them a communication with the grand gallery or canal of the counter-mines. These *rameaux* being properly made, will facilitate the construction of the *fourneaux* and counter-mines that will be made where they may be wanted, for overturning the works of the besiegers, and thereby either rendering them useless or greatly retarding the progress of them.

As these contrivances depend on the skill and management of the commandant or governor, the necessity of times and occasions, and the convenience of places, will furnish him with the means of inventing new ones. Certain it is, that if he is determined to defend the works entrusted to his care, and knows how, the enemy will not gain one foot of ground, after he once gets within pistol-shot of the out-work, without losing a good deal of time. It would otherwise be useless to fortify places, and to know how to defend them, if this knowledge did not lead us to understand that the use of it is to render a moderate number of troops equal to the force of a powerful army.

If the ditch be dry, *fourneaux* prepared beforehand will be very useful for overturning both the sap and the adjoining lodgment: and when this cannot be done, in consequence of the ditches being full of water, the besiegers will not even then be masters of the covert-way, although the sap be commenced, and even open for entering it; for the besieged ought not to abandon it entirely, till the besiegers have placed their cannon along the faces of its parapet, to destroy the palisades and moveable traverses that are placed within

COUNTER-MINES.

it. Under these faces of the parapet of the covert-way there should be good large *fourneaux*, for overthrowing the batteries on them, when they are ready to fire or open. Nevertheless, the besieged ought not to put fire to these *fourneaux*, but as late as possible; but should wait till the cannon of the flanks of the place, high and low, have endeavoured to ruin or destroy the construction of those batteries that are opposite to them. Meanwhile the besieged need not entirely abandon the covert-way, since they can always go to it and return on one side and the other, under cover of the moveable traverses, and the retrenched places of arms; and when they are forced to quit it, without any hopes of returning to it, they can spring the *fourneaux* already mentioned.

The besiegers, having no longer an enemy to combat in the covert-way, will attack the retrenched places of arms; the taking of which will give them a good deal of trouble, if they be rivetted with masonry, and well fraised and palisaded in the bottom of the ditch. They will, in such case, be obliged to open a passage for themselves into them by means of *fourneaux*, which they will not be able to make easily, if the ditch be well defended. Thus the attack of these small works will retard, for some days, that of others of more importance for the preservation of the place. The officer, who commands in such a small out-work, should retrench himself in it with good palisades, for the security of his retreat; and in retiring, he should spring the *fourneaux* that have been made there, to destroy the whole work, or to wait till the enemy has made his lodgment within it before he springs them, in order to envelope or bury him in the ruins of it.

By means of counter-mines, the defence of the ravelin and its retrenchment may also be rendered very obstinate, and the taking of them troublesome to the besiegers; and when the troops employed in their defence are obliged to quit them entirely, they should spring the *fourneaux* that have been made, for the destruction of the retrenchment.

It rarely happens that the besieger, in his attack, embraces more than one front of the place attacked. What he principally occupies is commonly the ground necessary for placing or erecting the batteries opposed to the flanks of the bastions attacked. As these batteries cannot exist without an epaulement, to cover them from those parts of the place that can otherwise see them, and are not embraced by the attack, it is this epaulement that should be attacked and destroyed. In order to accomplish this object easily, the besieged should push a subterraneous gallery, beginning from the ditch of the ravelin not attacked, and the nearest to the attack, till it be carried quite under this epaulement. There they should make *fourneaux* or counter-mines, which, by their effects in springing, will uncover the flanks of the batteries, that will soon be dismounted by the cannon of the ravelin not attacked, and of other parts of the place that can discover them. This should be practised both on the right and left of the attacks, if possible, at the same time, in order to surprize the enemy at the same instant with a sally, supported from all the works of the place the nearest to the attack. The besieged should even attack the enemy in those places where he has least reason to suppose he can be attacked; and to do it with the greater certainty and safety, they should have a subterraneous gallery from the middle of the curtain to the angle formed by the two demi-gerges of the ravelin. This gallery would, in its passage, serve as a caponier for the defence of the ditch, as well as a way or road to the ravelin, under which several counter-mines should be made, but not sprung till the enemy is oc-

cupied in giving the assault to the body of the place. The fire being put to the counter-mines under the lodgment, which they will of course destroy, the besieged should, some of them, return into the ravelin, and establish a lodgment there, if it be possible. This diversion will produce a good effect, will furnish reason or an occasion for the enemy to abandon the breach made in the body of the place, and will afford them sufficient time for establishing themselves in the ravelin: for it is doubtful whether the enemy will then persevere in his attack on the body of the place, or, leaving it, will go to support the troops attacked, overcome in the ravelin. In truth, things of this nature happening at the same time, are apt to embarrass the greatest commander. But if the besieged have taken care to have a branch of the canal of counter-mines made under the ravelin, and this branch pushed quite under the ruins of the breach in the same, these ruins may be easily thrown away or aside by a *fourneau*, and the enemy thereby deprived of a passage into the ravelin, which will force him to attack it anew as at first.

A miner that knows how to make a proper use of counter-mines, constructed as they ought to be, may stop the enemy's miners, stifle them, or destroy their works in such a manner, as to make it impossible for others to return to the same place; or, if he please, let them enter the galleries of the counter-mines, block up the passages, and either take them prisoners or kill them as he thinks proper. The besieged, indeed, who know how to avail themselves of all advantages, will be for a considerable time, and in a great measure, masters of the fate of their enemies. For without mentioning all the snares and stratagems, which the besiegers cannot foresee, who, finding it impossible for them to advance, and the under-ground passages stopped, and unable to make mines that can be of any use to them, are driven by necessity to brave the mines, and carry on their attack above ground; which, if they be obstinately opposed or resisted, exposes them to many disasters, hardships, and difficulties, not only in making their approaches, but also in making their lodgments on the covert-way, and in every other place where they dare to carry on their works. If they advance by sap towards the covert-way, it will be proper to give them notice, from time to time, by some *fourneaux* or counter-mines, of the danger they are in. But if they make their attack sword in hand, it will be in a great measure useless to make use of the counter-mines; for, though they might startle and alarm the troops during the attack, and bury some men in the earth they throw up, the excavations made by them might serve for lodgments. It is, therefore, better and advisable to reserve them for disturbing the besieger's works, and of course for gaining time. Besides, the counter-mines, intended for being first sprung, should not be loaded till they are about to be used, that they may be always ready for preventing the enemy from advancing, which they cannot do, if they are charged beforehand. The besiegers, on reaching the covert-way, may attempt to re-enter the ground, whilst he completes his lodgment; but they will be again obstructed by the counter-mines, and be exposed on all sides to the same difficulties as before. The moment they begin to raise batteries for making a breach, it is proper to destroy all their lodgments on the covert-way, by springing the uppermost counter-mines, without waiting till the guns are mounted: for these small counter-mines loosen the earth where the cannon are to be mounted; and the next counter-mines that are sprung throw them, after they are mounted, towards the town. After these batteries are repaired, and the guns are again mounted, which cannot be done in a very short time, the next counter-

mines,

mines, if they be properly disposed of and charged, will, when sprung, throw the guns a second time towards the place, and into the ditch. And if there be a depth of earth from 25 to 30 feet, the same thing may be done six or seven times, which must astonish and dishearten even the most obstinate and persevering enemy.

COUNTER-Mure, or **COUNTER-Wall**, a little wall built close to another, to fortify and secure it, that it may not receive any damage from the buildings contiguous to it.

By the custom of Paris, if a stable be erected against a partition-wall, there must be a counter-wall added, eight inches thick. M. Buller observes, that the counter-wall ought never to be bound, or connected, with the proper wall.

COUNTER-Mure, in *Fortification*. See **CONTRA-Mure**.

COUNTER-Opening, in *Surgery*, is an incision made in the most dependent part of an abscess or wound, opposite to some other wound already existing.

COUNTER-Pale, in *French Heraldry*, denotes what we term paly of six per fesse counter-changed; the number of divisions being always expressed.

COUNTER-Part, a part of something opposite to another part. Thus, in *Musick*, the bass and treble are two counter-parts, or opposite parts.

COUNTER-Part, in *Law*. When the several parts of an indenture are interchangeably executed by the several parties, that part or copy which is executed by the grantor is called the *original*, and the rest are *counter-parts*; though it is better, and of late it is most frequent, for all the parties to execute every part, which renders them all originals.

COUNTER-Passant, in *Heraldry*, denotes two animals passing or walking different ways, one to the dexter, the other to the sinister.

COUNTER-Plea, in *Law*, a replication to a plea, or prayer.

When a tenant by courtesy, in dower, or other real action, prays the view or aid of the king, or him in the réversion, for his better defence; or if a stranger to the action begun desire to be admitted to say what he can for the safeguard of his estate: that which the demandant alleges against this request, why it should not be admitted, is called a counter-plea.

In this sense it is used in stat. 25 Edw. III. c. 7. So that counter-plea is, in law, a replication to "And Prier," and is called "counter-plea to the voucher." But when the voucher is allowed, and the vouchee comes and demands what cause the tenant hath to vouch him, and the tenant shews his cause, upon which the vouchee pleads any thing to avoid the warranty; this is called "a counter-plea of the warranty." *Tems de Ley*. Stat. 3 Edw. I. c. 39. There is also a counter-plea to the plea of clergy; see *Benefit of CLERGY*.

COUNTER-Plot, a plot, or intrigue, contrived to thwart and overthrow another.

COUNTERPOINT, *contrapunctum*. Lat. *Contrappunto*, Ital. in *Musick*, is nearly synonymous with *composition*; with this difference, according to Rousseau, that "the invention of *melody*, or a single part, may be called *composition*; but that *counterpoint* implies the *harmony* of two or more parts." To this difference we cannot subscribe: as it extends the title of *composer* to the inventor or compiler of a high part; an honourable title, due only to the masters of harmony, whence almost all good melody is derived. There is as much difference between the arranging single sounds into a tune, and composing a piece of music in many parts, as between writing a ballad and an epic poem. The subject of a ballad, indeed, may be made the foundation of a poem of great length, and that of a naked melody may be the

theme of composition in many parts; but if the author of the melody is incapable of cloathing it with harmony, he is no *composer*.

Of the natural production of harmony, or chords, from the vibrations of a single string, or sounding body, we have given an account in the article *BASSE fondamentale*. This is the only natural harmony with which we are acquainted; the rest is metaphorical, and allusive to practical music; and even this fundamental chord cannot be called a work of nature, for the materials by the medium of which it arrives at our ears are artificial; nature neither casts a bell, nor twists a string. The Mercurian lyre, if we may believe the poets and fabulists, was not only formed but strung by nature. For among the various opinions of the several ancient writers who have mentioned the *Cebelys*, or *Tesludo*, and ascribed the invention to the Egyptian Mercury, that of Apollodorus is the most intelligible and probable. "The Nile," says this writer (*Biblioth. lib. ii.*), "after having overflowed the whole country of Egypt, when it returned within its natural bounds, left on shore a great number of dead animals of various kinds, and, amongst the rest, a tortoise, the flesh of which being dried and walted by the sun, nothing was left within the shell, but nerves and cartilages, and these being braced and contracted by desiccation, were rendered sonorous; Mercury, in walking along the banks of the Nile, happening to strike his foot against the shell of this tortoise, was so pleased with the sound it produced, that it suggested to him the first idea of a lyre, which he afterwards constructed in the form of a tortoise, and strung it with the dried sinews of dead animals."

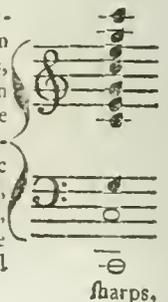
When persons unacquainted with the refinements of the art, talk of *natural music*, they only mean such strains as are common, and which, by frequent hearing, they think they understand; but, literally, there is no *natural music*; the whole is a work of art.

The title of *counterpoint*, given to composition, or music in parts, preceded not only the invention of clefs, but of lines and spaces. In many missals we have seen the infancy of simultaneous sounds in *points*, or marks over particular words and syllables, like accents; and, afterwards, as the *monks* and *priests* began to feel a pleasure in the consonance of a 4th, a 5th, or an 8th, a second point or dot was placed over the first. These were not in the beginning regulated by lines, but by their greater or less degree of elevation and distance from each other. After some time, we found a line drawn through such dots or points as were on its level; then two lines, one red and the other yellow, to denote the tenor and base.

After this, two or three centuries elapsed before a third and fourth line were added, at which the Roman missals have remained ever since. This is the short history and origin of the term *counterpoint*.

We take it for granted that whoever thinks of composing knows how to perform with his voice, or some instrument, the productions of others—knows a common chord, and something of thorough base—and if the instrument on which he plays is the piano-forte or harp, so much the better.

As a foundation for the whole art of musical composition, we shall give the common chord of C natural in all its stages: after this, the table of intervals should be studied, in order to know in half notes or semitones, the distance between sound and sound. See **INTERVAL**. Then the 8 notes in the diatonic scale, which form a key in simple *melody*, making C the representative of all major keys, and A of the minor. We, at first give the minor key *descending*, to avoid accidental



C O U N T E R P O I N T.

sharps, of which we shall speak hereafter. See the terms MAJOR, MINOR, and KEY.

Concords are the unison 8th, 5th, 4th in a common chord, and with a 6th. The only intervals that can rise and fall together, gradually, are the 3ds, and 6ths, and of these the unison and progress are unlimited. An entire movement may be composed in any notes of the time table, put into measure, consisting of nothing but a series of 3ds, or 6ths. See *Plate VI. N^o 3.*

For the fundamental base to every found of the scales major and minor, ascending and descending. See *Plate VI. N^o 5.*

See in *Plate XII.* an ascending and descending scale with two fundamental bases to each note, and another with three fundamental bases.

Ascending and descending scales in the base, with a treble, or discant. See *Plate VII.*

A supposed base to the scale ascending and descending, major and minor. *Plate VII. III.*

The unison 8th, 5th, and 4th, are called perfect concords, as they admit of no change, without becoming discords. No two of these are allowed to rise or fall together, gradually, or by a leap.

For a base, or 3d part, to a series of 3ds and 6ths. See *Plate VII. N^o 2.*

Supposed base to the scales. *Ib. 3.*

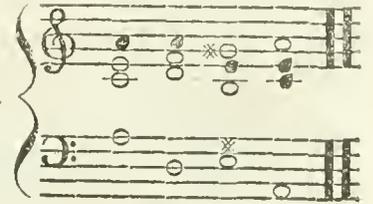
The fundamental, or principal base, is that which carries a common chord, as a 3d, 5th, or 8th, or two of the three, or all three together.

The three fundamental bases to every key, are the key-notes, the 5th above, and 5th below, or 4th and 5th of every key; in the common chords of which bases the student may pick out a regular series of founds.

Example in C major.



Example in A minor.



See THOROUGH-base, BASSO PRINCIPALE, and *Plate II.*

Out of the scale of each key, he should try to form melodies in various measures; at first, totally without accompaniment, and then from the fundamental and supposed bases to the scales, *Plate VII., III.,* try to discover what base will suit the passages in his melodies.

Thus far no notice has been taken of *discords*, except sometimes adding the 7th to the common chord, which is the only addition to it, that would not rob the base of the title of fundamental.

Discords are the 2d sharp, 4th or tritonus, the 7th and the 9th. But every concord may be made a discord by the note above it: as the 3d by the 4th, the 4th by the 5th, the 5th by the 6th, the 6th by the 7th; and indeed the 8th by the 9th.

Every interval that exceeds the bounds of the octave, is termed a compound interval, or octave of some simple interval: as the 9th is a recurrence of the 2d, the 10th of the 3d, the 11th of the 4th, the 12th of the 5th, and the 15th of the octave.

The fifth is composed of two thirds, a major and a minor, or a minor and a major; the 3d of two seconds; the major 2d of two semitones.

Before we enter on the preparation and resolution of discords, it may be necessary to characterize all the natural intervals within the limits of the octave.

The succession of *unisons* (though they cannot be called intervals) is prohibited in *counterpoint*, unless when two treble parts sing or play throughout in *unison*, with design.

The second is a discord, and prepared and resolved in the base: it is accompanied by the $\frac{6}{4}$.

The 3d, an imperfect concord, is wanted in the accompaniment of every other concord and discord, except the 2d and $\frac{6}{4}$.

The 4th is a perfect concord, when used in the common chord between the 5th and 8th, as it is when joined to the 6th and 8th; but with the 5th or the 2d it is a discord. The 4th is accompanied by the $\frac{3}{2}$.

The 5th is a perfect concord, but made a discord when united with the 6th. The complete chord is $\frac{8}{5}$.

The 6th is an imperfect concord, often doubled and accompanied by the 3d.

The 7th is a discord joined to the common chord, or $\frac{8}{3}$.

The 8th is a perfect concord; and wanted in all chords, except those of the 2d or 9th.

The 9th is a discord, and octave of the 2d, but differently accompanied $\frac{9}{5}$. See *Plate V.* an engraving of a thorough-base. *Card.*

There are in melody three progressions, or ways of moving from found to found:

Moto retto, when two parts rise or fall gradually together.



Moto obliquo, oblique motion; one part moving, and the other remaining stationary,



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Moto contrario, contrary motion; one part rising and the other falling.



Plain counterpoint, is note against note, in sounds of equal duration, and without discords.

Figurative, or florid counterpoint, requires measure, in notes of different lengths.

Relative sounds, are such as belong to two or more chords; as C is related to F and A, as G is to C and E, being essential sounds to the chords of each. See *Plate XII*.

The succession of *two 5ths* rising or falling together, is prohibited from the want of relation; as there is no found in common with the chords of G and A, or G and F. In the construction of a grammatical sentence every word has its relative, and the breach of the rule against 5ths in succession, is equally offensive to a cultivated ear, with a false concord to the mind in grammar.

Two unisons, or two octaves in succession, in full harmony, are prohibited from their want of variety; but these can not only be borne, but, when admitted with design, have a good effect. The ancients seem to have had no other simultaneous harmony or music in parts, than what was produced by a succession of multiplied unisons and octaves; nor, except in Europe, is counterpoint cultivated, or does it afford pleasure to the natives of three parts of the globe.

It is become necessary, in modern compositions, that the melody should be *phrased*; that is, divided into periods of an equal number of bars; as 2, 4, 8, 12, or 16. As verse is regulated by feet and syllables, melody is lame and ungraceful if its periods consist of an unequal number of bars, as of 5, 7, 9, 15, or 17. A verse with a syllable too much or too little, does not hobble more than such imperfect measures in music. A period of this kind in melody, is called by the French *phrase manquée*. Neither Fouchs, nor any of the theorists of the last century, gave their examples in an equal number of bars, upon *principle*. But all matters and writers of elementary treatises on *counterpoint*, should now enforce it as a precept, that melody should be regularly phrased by all young students in composition, who aspire at grace. Every movement which derives its name from a dance, such as the minuet, rigadon, gavot, saraband, &c. has its strains regulated in this manner. In serious dramatic air, in sudden gusts of passion or surprise, or in comic scenes, to produce some grotesque or humorous effect, the phrases are frequently broken with success; but never, where either grace or energy is required, should a young contrapuntist be inattentive to the phraseology of his melodies, See *RHYTHM*.

And not only the number of bars in every strain or period should be regular, but the accents regularly placed in each bar. This precept concerns the performers as well as composers. See *ACCENT*.

The preparation and resolution of discords require much study, experience, and reflexion. Dr. Pepusch has given in 2, 3, and 4 parts, the shortest and most clear rules and examples for this important article in counterpoint, that are to be found in any elementary work.

We have not room on our plates for the notation of his

examples, but shall give here a short specimen of each discord, and refer to his excellent little work, entitled "*A Treatise on Harmony*," for the rest.

Discords	Prepared	Resolved on the
the 2d by the	unison 3. 5. 6. 8.	3. 5. 6.
4th	7th, and all the concords	3. 6. 8.
7th	3. 5. 6. 8.	3. 6. 5.
9th	3. 5. 6. never in the 8th	3. 6. 8.

Concerning discords, three circumstances are to be considered: as on what part of a bar they are to be *prepared*; when *struck*; and when *resolved*.

In common time of two notes in a bar, the 1st is accented and the 2d unaccented. And, in common time of four notes in a bar, the 1st and 3d are accented, the 2d and 4th notes unaccented. In triple time of three minims, three crotchets, or three quavers in a bar, the first note only is accented, and the other two are unaccented. Of the three circumstances, therefore, relative to discords, it is to be remembered, that the *preparation* is on the unaccented part of a bar; the discord is *struck* on the accented part, and *resolved* on the unaccented part of a bar. See examples of all discords in notation of 1, 2, 3, and 4 parts, *Plate XIV. XV. XVI*.

There are still other discords that are unnoticed in the figuring, called *passing notes*. See *ACCENT*. This subject has been well treated by Dr. Pepusch, and the other able theorists on whom we lean. But as an article in a dictionary is not a treatise, we must compress our examples into as short a compass as necessity requires. See *Plate XVI*. See *PASSING-notes*, and *DISSONANZA alla sfuggita*.

Not only the succession of 5ths and 8ths is prohibited in counterpoint, but the *suspensions* of them. As Cæsar's wife was not only to be chaste, but unsuspected. See examples of this harmonical vice, and of the prohibitions. *Plate IV*.

P. Martini has given a general rule for avoiding the *suspension* of 5ths and 8ths, by not moving from any consonance to a perfect concord by similar motion: as from a 3d to the 5th—from the 8th to a 5th, or from a 5th to a 3d or 8th, or from a 6th to an 8th, &c.

The air, song, sonata, or whatever the movement may be, which a student in counterpoint attempts to compose, should begin and end by some sound or sounds of the common chord of the key note. In a major key, an accidental sharp becomes the 7th of a new key. So that if the piece begin in C, the first additional sharp that occurs is usually F♯, which leads to G, the half-note above such sharp; so C♯ leads to the key of D minor; G♯ to A, and D♯ to E minor. In minor keys the 7th is so constantly sharp, as hardly to be called *accidental*; as in the key of ♯A, G the 7th requires an accidental sharp whenever it is used ascending.

An accidental flat in any of the parts of a major key becomes the 4th of a new key. As in F, which has only one flat at the clef, and a flat to E implies the key of B♭, which has two flats at the clef, and in the key of D minor, which has but one flat at the clef, a flat occurring at E, implies the key of G minor, which has two flats, &c. See *MODULATION* and *THOROUGH-bass*, or *ACCOMPANIMENT without figures*. See thorough-bass chords, and rules for playing without figures, *Music, Plate V*.

A regular discord, essential to the harmony, is the suspension or anticipation of some sound of the preceding chord,

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chord, by which it is prepared. Its resolution is the descending one degree on a concord to the base, supposing it to be stationary. The 2d makes the unison a discord. It is prepared and resolved in the base, which descending one degree, renders it a 3d. See examples of the preparation and resolution of all the regular discords; *Musie*, Plate XIV.

As the 3ds and 6ths of any key are the only concords that can move up and down in regular succession, the student in exercising his ear in different measures in the two keys of C and A natural, must remember that a clofe cannot be made in A minor, without an accidental G ♯, expressed or understood. See successions of 3ds and 6ths in *Musie*, Plate VI.

Till about the middle of the last century, F the 6th, as well as G, the 7th of A minor, used to be made sharp in ascending. But Tartini found that F ♯ in that key destroyed its minor effect; he rather preferred the leap of an extreme sharp 2d from F natural to G ♯, than destroy the natural pathos of the minor key. But as some writers on music, and composers, still adhere to the old scale of A minor, ascending to the octave through the sharp 6th as well as 7th, we shall make F both natural and sharp, in the ascending scale of A minor, to give the young composer his choice between them.

The fundamental or principal base of these scales being impressed in the memory, and a treble drawn from the chords given to the scales in the base, the young harmonist should try to find a base to the scales in three parts; the treble moving by 3ds. See Plate VII. Two fundamental bases to each note; three fundamental bases to each note; and the continued or supposed bases to the scales.

Having given the several treble rules with their accompaniments; described the several intervals; the preparation and resolution of discords; it is time to recommend to the young student in *counterpoint*, the rule which has been formed for accompanying the scale ascending and descending, in the base, major and minor, which seems to have been invented and first brought into use in France, under the title of *REGLÉ DE L'OCTAVE*; (which see;) but by whom is not settled. Rousseau, in the article, says, "this harmonic formula was first published in 1700 by the Sieur Delaire." But in treating of accompaniment, he assigns it to Campion. If it could be ascertained that either of these musicians was author of the rule, we should have no doubt of its being the latter. In 1700, no such harmony as that of the *regle de l'octave* was given to the scale; nor, till about the middle of the last century, was it so accompanied. But of late years, almost all harmony seems built on the chords given to the scale in this rule; which is not only useful in accompanying a base without figures, but in harmonizing the scale in four parts, by young composers, and in extracting melody from its chords. A specific harmony being given to each note of the scale, ascending and descending in every key; if the young composer, or performer, is certain what key he is in, the knowing this rule alike in all keys, will remove every doubt as to the harmony of each base which he wishes to use or accompany. We shall therefore, in the plates, give this rule in a figured base, and write the chords in notation with their full complement, which may be drawn out into a score, making the upper part the first treble, the middle note of the chord the 2d treble, and the lowest note the tenor.

For fundamental base, and supposed base, to the treble scale, see *Musie*, Plate VI. and VII. And for a division base to the treble scale major and minor, ascending and descending, see *Musie*, Plate VIII.

The young musician must remember, that this rule is only to be rigidly followed, when the base rises or falls gradually. In wider intervals, as in leaps from the key note to the 3d,

4th, 5th, or 6th, common chords will do, in writing or playing, unless some discord is prepared for the second found of such intervals, such as a 4th, 7th, or 9th, which never occur in the *regle de l'octave*. See *Musie*, Plate V.

As florid, or figurative *counterpoint*, includes every species of composition, such as *imitations*, *fugues*, *canons*, *double counterpoint*, &c. though these will be found fully described and discussed, severally, in their places, yet they must be spoken to here, *in order*; as constituent and important parts of the present article.

Imitation is an irregular fugue. When a passage led off by any one of the several parts of a composition is repeated by another in the same kind of notes in any part of the scale, it is called *imitation*, to distinguish it from a regular answer to a subject of fugue.

Fugue requires an answer in the unison, octave, 5th, or 4th of the key, in which the subject is led off, to be accounted regular: as in those keys alone, the intervals will be the same. This rule will be illustrated with examples in notes, in the music plates.

Canon, is a perpetual fugue; as the part which leads off the subject gives law to the rest, from the beginning to the end of the movement: thence *canon*, from *κανων*, Gr. *regula*, *norma*, a rule or law. In Bird's well known canon of *Non nobis Domine*, the first treble sings in the key of G major, the second in D, the fourth below, and the third, or base, in the double octave, or 15th below the first treble; but always in the same intervals.

The contrivances and difficulties of this species of composition, with which ingenious men have loaded it in pure pedantry, and ambition to be thought more cunning artists than their neighbours, have lost that reverence which used to be paid them, ere melody was cultivated, and its more intelligible merit was tasted and understood. Yet, as *canons* are still respected by masters, who know the difficulty of their construction, the young contrapuntist, at his leisure hours, as an intellectual employment, should try his strength in exercises of this kind. Though out of the infinite number of *canons* known in our own country, and composed by natives, the only two that continue in favour, and general use, may be said to be *Non nobis Domine*, of Bird, and "Let's drink and let's sing together," by Dr. William Hayes of Oxford; but the favour of these, in private societies, is nearly equal to that of the two national songs, "God save Great George our king!" and "Rule Britannia," in public.

Examples of fugue and canon are given in notation in the music, Plates IX, X, and XI.

Double counterpoint is not so easy to describe as fugue and canon. There is no chapter on the subject in Pepusch, nor do we remember its being mentioned in his treatise. Grassineau is silent on the subject, and Brossard just mentions, *Fuga di contrappunto doppio*, without explanation. In later writers, however, it makes a long article, of no very easy comprehension. The shortest and most intelligible explanation which we can give of this artful contrivance is: "a composition written in such a manner, as that the several parts can be inverted, and reciprocally serve as accompaniments to each other, and the harmony still be good."

Rousseau does not mention this species of counterpoint; but in the Supplement to the first edition of the *Encyclopédie*, there is a long, though an obscure article, on *double counterpoint*, but illustrated with no good examples. It is mentioned in Walther, from a work of Mattheson, but unnoticed in the plates. The invention, however, is not new, for *Pedro Cerone, della Musica*, published in Spanish at Naples, 1613, in folio, contains a long chapter on the subject, lib. xiii. p. 734, which he thus introduces: "To the end that no-

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thing in counterpoint may remain unexplained, we shall shew in what an artificial and wonderful manner, and with what good effect, the Italians can treat a simple melody (*canto llavo*), in *contrappunto doppio* (*contrappunto doblados*), which is nothing more than changing the parts, making the highest the lowest, and lowest the highest, in various ways; by which a new melody and a new harmony are produced, and effects totally different from those of the first performance. And this may be effected in three different ways; in the 8th, the 10th, and 11th."

This is a very clear and accurate definition, written more than 100 years before Mattheson's book was published. For the full title of Cerone's work, which is extremely scarce, see his biographical article.

Pedro Cerone de Bergamo has calculated the mutations of intervals by inversion, and his explanation is so ample and satisfactory, that there seems little occasion to have recourse to more modern authors for further information on the subject of *double counterpoint*. Yet, lest the student should still be perplexed with doubts and difficulties, and perhaps, not perfectly convinced of the utility of this contrivance, we shall give him the good Padre Martini's opinion and precepts on the subject, who was always the zealous friend and patron of studious youth.

Padre Martini tells us, that among all the most profound and useful contrivances in the musical art, is that of *double counterpoint*, concerning which Padre Camillo Angleria, in his "Regole di Contrappunto," cap. xxv. p. 94, writes thus:

"After the student is able to write with facility in good harmony for four voices, arranging the several parts agreeable to the subject which he has chosen, and wishes to proceed to the most sublime inventions of so noble a profession, he must begin to study *double counterpoint*, and all its subtleties; changing the grave to the acute, and the acute to the grave, with elegance, grace, and good harmony."

The reader will see on our music plates his first examples of double counterpoint to the scale in the octave, which he pursues in 2, 3, 4, and 5 parts, with great abilities. These examples in notation are followed by instructions for the different species of this kind of composition, with lists of the concords and discords to be avoided; informing the student that by double counterpoint is meant an ingenious and artful composition in various kinds of concords and discords, regularly prepared and resolved, particularly in the octave, which has been long practised by masters of the highest class, inverting the parts an 8th above or below its first situation, at which pitch the inversion is most clear and obvious, avoiding the use of the 5th, which by inversion becomes a 4th. In this most simple species of double counterpoint the movement or period should begin and end in the octave; as the following intervals or numbers will shew:

1.	2.	3.	4.	5.	6.	7.	8.
8.	7.	6.	5.	4.	3.	2.	1.

Double counterpoint in the 10th has not been so frequently used by renowned old masters as in the octave, whether from being more difficult and less pleasing, we will not determine; it is however practicable under the following restrictions: two-thirds or two-tenths cannot succeed each other ascending or descending diatonically, as they involve the compound in two 5ths, or two unisons. In like manner two 4ths are prohibited, which by inversion would become two 5ths; no more can two 4ths or two 7ths be used in ligatures or binding notes, as the following numbers will manifest:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
10.	9.	8.	7.	6.	5.	4.	3.	2.	1.

Rules for double counterpoint in the 12th.

Counterpoint in the 12th, is a composition in which one, two, or more parts may be transposed a 12th above or below, in which the composer may use all the concords and discords, except the 7th resolved on the 6th, which has not a good effect. If the 7th is used it ought to be resolved on the 5th, the base rising one note. (*See Disjunctive CADENCE*.) It is to be remembered that the part or parts transposed a 12th should begin and end in the 5th, the rest remain in their first situation. This kind of double counterpoint is seldom used on account of its difficulty; but it not only produces pleasing harmony, but allows of modulation. In this species of counterpoint, the following is the inversion of the intervals:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
12.	11.	10.	9.	8.	7.	6.	5.	4.	3.	2.	1.

This excellent theorist (Padre Martini), has traced *double counterpoint* up to the time of Zarlino, who says (*Instit. Harmon. p. 3. cap. 56.*). "Il contrappunto doppio non è altro che una composizione fatta ingegnosamente, che si può cantare a più modi, mutando le sue parti; di maniera, che replicata si oda diverso concerto da quello, che nelle stesse premieramente si udiva." And this passage P. Martini introduces by saying, that "of all the most erudite and useful contrivances in music, there can be no doubt but that *double counterpoint* is of the first importance." Many are the modes in which masters have reversed the parts upon this principle; but for more clearness and certainty, we shall reduce them to five species. The first will be that of writing or composing a part upon a fragment, real or imaginary, of *canto fermo*, which may be transposed in various ways above or below the text; as in the octaves, 5th, 3d, or 6th. The second species is that in which the upper part, as well as the lower, may be transposed in various ways. The third species is when the parts may be transposed in contrary motion (*moto contrario*). In the fourth species the parts are invertible, as in the second and third species; but require a free base to complete the harmony. The fifth species resembles *imitation* in fugues, by some irregularities of characters or intervals. How useful and necessary *double counterpoint* is to composers, seems most apparent in writing fugues of all kinds, canons, madrigals, and other compositions, which cannot be rendered complete, without a perfect knowledge of *double counterpoint*. And if, at present, the art of composition is confined to genius alone, without science, it is owing to the ignorance or neglect of this most useful contrivance." Indeed a fugue is little more than a series of passages in *double counterpoint*: and Haydn and Mozart seldom, in their symphonies, lose an opportunity of availing themselves of their knowledge in the art of *inversion*.

The examples of double counterpoint in notation, we shall give from the *Regole di Contrappunto*, Rules of Counterpoint, by Sala, the last writer and the best on the subject, in Italy, of whom we shall have frequent occasion to speak hereafter.

Modulation, another very important part of counterpoint, will be amply treated, generally, in its proper place. But here we shall only point out the natural and usual modulation in any given key, in the course of a movement of considerable length: For example: if the key is C natural, the first modulation or change of key, is made by an F♯, which leads to G major, the 5th of C. The second modulation is usually into D minor, by an accidental C♯ or B flat. Then into A minor, by a G♯; and if the movement is long

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long, into E minor, by a D ♯. After this, the subject is generally resumed in the original key. Then a modulation into F major, by an accidental B ♭; which when annulled by a ♯, restores the key of C, and leads to a conclusion in the same kind of close, as at the end of the first strain in G.

In A natural, the representative of all minor keys, the most agreeable modulation is first into C major, the minor 3d above. Then into D minor, or F major by a C ♯ or B ♭. From D or F to C by a B ♯ as a 6th to D or 3d to G, is a pleasing modulation into C. Then by a G ♯ in one of the parts, the original key of A minor is restored. In old music, the first modulation from A natural, was into its 5th of E natural by a D ♯; but this so seldom happens in modern music, that the modulation into E seems unpleasant and old fashioned.

The fundamental and supposed bases to chromatic scales, are given in the plate referred to in the article MODERN CHROMATIC; which see, *Plate XVI*. The term STRAIN, in Music, is used for a whole movement, and for a part of a movement, as a pleasing strain; or speaking of a movement divided into distinct parts, or portions, by double bars, each portion is numerically distinguished; as the first strain, the second strain, &c.

Variation, which, for a long time, was only multiplying the notes of an air, without embellishing it, or improving the composition, and with which the musical world was tired; the fertility, taste, and resources of Haydn and Mozart have rendered interesting and delightful.

Time, musical measures, accents, and phraseology, upon which grace and energy solely depend, must be studied by a young composer, or contrapuntist, as sedulously as melody and harmony. See their distinction and rules under their several heads.

Some knowledge of the ecclesiastical modes of the Romish church seems necessary to an English composer, to enable him to ascertain the answer to subjects of regular fugue. All the Roman catholic writers on music, recommend this method. See ECCLESIASTICAL MODES, AUTHENTIC, and PLAGAL. Dr. Pepusch, a Lutheran, prefers SOLMIZATION. Both methods are doubtless good; but the being careful that the answer is made precisely in the same intervals as the subject, seems to include a more extensive modulation and general use of keys. Pepusch confined all fugues, and almost all melody to the three hexachords: *Durum, Natural,* and *Molle*; which see: and the ecclesiastical modes exclude all transposed keys, as the writers on canto fermo, call all keys with more than one sharp or one flat, admitting only such as belong to the 8 or 12 modes. See MODES of the Ancient Greek Music, and ECCLESIASTICAL MODES.

Thus far we have ventured to advance in the rules of counterpoint from our own studies and experience; but the authors of highest authority, whom we can recommend to musical students to supply our deficiencies, either from want of knowledge or want of room, are Fouchs, Dr. Pepusch, Padre Martini, and Sala; whose works we shall severally characterize in the biographical articles, which we shall assign to these able and safe counsellors. We shall here only give the titles of their several works, and specify the peculiar manner adopted by each, in treating the subject.

The Treatise, on Composition by Fouchs, first maestro di cappella to the emperor Charles VI., was originally written in Latin, and published at Vienna in 1725, under the following title, "Gradus ad Parnassum, sive Manuductio ad Composit. Musicæ Regularem." The author begins with harmonies and the ratio of sounds. The practical in-

structions are given in dialogue, between a master and scholar. All the examples are written on canto fermo.

This work was translated into German, in 1742, by Lorenz Mizlern, and published at Leipzig, 4to. In 1761, an Italian translation in folio, appeared at Carpi, by the ecclesiastic Manfredi, recommended in strong terms to lovers of music by the celebrated Niccola Piccini, in a letter to the translator. And, in 1767, a translation into English of the practical part of the work, without the harmonies, by Hoeck, was published by Welcker, in folio: all these several editions are now become scarce.

Dr. Pepusch's excellent little Treatise on Harmony, containing the chief rules for composing in two, three, and four parts, was published in London, 1731. In this work the precepts are short, clear, and well-arranged. The author goes through the concords and discords, shewing the use of each, separately. His rules for fugue and canon are admirable.

In the introduction, his definitions are short and clear, except modulation, which, at present, is confined to change of key; but he talks of *modulating in one key*. In our old authors, indeed, to *modulate* was simply to sing, p. iv. for motions, read progressions from one part of the scale to another.

He rightly confines plain counterpoint to music without discords, and moving note for note, but p. 8, where, he says, that the skip in melody to a tritonus, or 5b is absolutely forbidden, he must not be rigidly followed, as some of the most beautiful effects are produced by those intervals.

We do not quite understand his going from the unison to the 3d minor, preferably to the third major. His recommendation of doubling the 3d or the 6th in accompanying the 6th preferably to the 8th, is good in slow movements; but in quick, a small hand would be embarrassed by frequent octaves: And in quick movements, a 3d is under the hand. Ex. 37. The avoiding 5ths, in a succession of common chords to fundamental bases, Ex. 39, by contrary motion deserves retention. Ex. 41. G 44. Fundamental and supposed bases, by turns, is always pleasing.

P. 25. The venerable doctor is, however, a little mistaken in his definition of *canto fermo*, making it synonymous with *plain counterpoint*. Canto fermo is a chant or single part, and has no reference to counterpoint or chords in the Romish church, where it is never sung, as with us, in four parts.

Neither our ears nor our eyes have been quite reconciled to "the 7th prepared and resolved in the base." p. 37. Nor the jumping up to the 7th, which we were before told should be prepared and resolved in the treble. This harmony seems never to have been much in use, and the examples from No. 84 to 91, are little better than jargon. About the middle of the last century the frequent use of the $\frac{7}{2}$ sometimes for 2 or 3 bars together, made us shire; but we were soon familiarized to it by the German symphonists of the Manheim school. A new combination has since been introduced, we believe, for the first time, by Krumpoltz: $\frac{9}{4}$, in a concerto composed for the harp of that exquisite performer his scholar and wife Mad. Krumpoltz; it was soon sanctioned by Haydn and Mozart, who have given it currency; and now, though it surprized at first, the public ear is reconciled to it, and minor contrapuntists will not let it be forgotten. But the unprepared minor 7th resolved in the 8th has not met with favour from the *serenum pecus*.

Dr. Pepusch's chapter on passing-notes, is very clear and useful, and will remove many fears of young harmonists.

COUNTERPOINT.

His discords by supposition are only appoggiaturas, and need no notice in figuring a base. Rameau's chords by supposition are different things. The comparing the several kinds of cadences to breathing places as it were in music, to punctuation or stops in literature, is just and happy. *Pre.* p. iv.

Modulation is so much extended, and indeed now become so unlimited, that Dr. Pepusch's sober, relative, and ecclesiastical modulation, which by having so long studied the compositions of celebrated and curious old contrapuntists, narrowed his ideas so much, that he regarded even Handel as an innovator. So that his chap. vii. p. 38, will carry a student but a little way on the mystic and difficult road of modulation.

Padre Martini's instructions are excellent, as far as they go; but the compositions which he gives in illustration being all rigidly formed on the ecclesiastical modes and canto fermo, few of them are applicable to secular music of the present times. We shall, however, give his authority for some of the rules laid down in this article (*counterpoint*), and occasionally quote him.

"Regole del Contrappunto pratico di Nicola Sala Napolitano, Primo Maestro nel reale Conservatorio della Pietà de Torchini, Napoli," 1794. This is the last capital work published in Italy, on the subject of composition. The author, who died in 1795, had been 40 years principal master of the conservatorio of la Pietà, and was the scholar and successor of Durante. During the long series of years in which he had been instructing the musical students in that celebrated seminary, he formed this regular system of *counterpoint*, which is printed at the royal press in two huge folio volumes, as large as De Lisle's maps; admirably engraved, and containing a regular series of well digested examples of composition of the most clear, neat, and correct kind, that have ever yet been published in any elementary musical work since the invention of counterpoint.

These four theorists are all excellent harmonists; and if the student has any genius or spirit of invention, he can have no safer guides in the flights he may take.

Counterpoint forms a long and elaborate article in the *Encyclopédie Methodique*. The subject has been taken up *ab ovo*, and its history and progress traced from the principal writers of the last century, adding, however, little new information from their own researches. Extracts are given from friends and foes to the art. Imitations, fugues, canons, and learned modulation, are called gothic and barbarous inventions by some, and sublime productions by others. We have the sarcasms of Rousseau, and abuse of Eximeno, against all learning and contrivance in musical compositions; and Padre Martini and German and English writers in their favour. Rameau, the French Coryphæus of the last century, is not even allowed a *repieno* part in this. The usual rules and exceptions are, however, at length given.

In speaking of Alessandro Scarlatti, and Durante, and their scholars, M. Ginguené has done justice to the Neapolitan school of counterpoint, though he afterwards invalidates his praise, by quoting the censures of the superficial *Eximeno*, who has nothing but *belle parole* with which to defend his prejudices and erroneous opinions. He is a far better master of the Italian language, than the art of music. How men who have read, and meditated on the subject, as much as Messrs. Ginguené and Framerie have done, could become the dupes of his eloquence and false reasoning, we know not! particularly after seeing the kind of composition for which he would supersede that of the church, by Aless.

Scarlatti, Leo, Durante, Pergolesi, Jomelli, Perez, Galuppi, Sacchini, &c.; who, though their dramatic style is all grace, elegance, and passion, have produced music for the church, of the most grave, solemn, learned and sublime kind, which Signor Eximeno qualifies with the epithets of *gothic and barbarous!* M. Ginguené has detected him in his chronology, and proved that during the reign of the Goths in Italy, so far from fugues, canons, and pedantic complication having their rise, no attempts at even plain counterpoint had been made. The work of Eximeno was unnoticed in Italy, except by foreigners who had subscribed to it, as they are called upon by artists and projectors to do to every thing, was, we believe, never read by three masters among the natives, and has long been as much forgotten as if it had never been written. However, among evocations, and the phantasmagoria of the Illuminati, Signor Eximeno has had a momentary resuscitation in France.

Among the general rules for counterpoint in the *New Encyclopédie*, a useful precept is given to the young harmonist, to avoid, in vocal compositions, every thing that offends a cultivated ear, or that is too difficult to be performed unless purposely intended to display a peculiar talent, capable of executing difficulties out of the reach of common abilities.

No musical article is more amply treated in that immense work than *counterpoint*. After a sketch of its history, taken chiefly from one of our English musical historians, eleven rules are given for counterpoint in general: 1st. To avoid the tritonus or sharp 4th in melody, unless as a sharp 7th it mounts to the octave.

2. The leap of a major 6th is prohibited in the treble, we know not why, as we could give several agreeable instances of its use in the melody of Italy, as well as that of our own country.

3. The major or sharp 7th, and all intervals in general, that are difficult of intonation.

4. Two major 3ds, which, however, to a binding note in the base, frequently happens, as in the following passage.



5. False relation, as C * against C ♯, or B ♭ against B ♯. But Eman. Bach, in appoggiaturas, has violated that rule.

6. No composition should begin on the 3d in the treble. A rule which has been abandoned more than a hundred years, as "Sweet Bird," by Handel, *Voi Avanti*, by Giardini, and "Would you Taste the Noon-tide Air," by Arne, would shew.

7. It is necessary always to pass from a perfect to an imperfect concord, in contrary or oblique motion.

8. Neither the 8th nor the 5th should be used in two parts, in the middle of a movement, much less the unison, as they afford no variety in the harmony.

9. All discords should be prepared and resolved, except the 7th, which is used in melody, as well as harmony, without restriction; as well as its derivatives, the 2d and 4th.

10. In counterpoint of many parts, if any of the intervals are doubled, the 8th should be preferred to the 5th, the 5th to the 3d; which last, at a close, would occasion two octaves. But we think that the 3d, whether major or minor, has the most pleasing effect, when doubled, of any of the intervals.

intervals. Even at a clofe, in many parts, one of the ſharp 3ds may fall on the 5th of the baſe.

11. The diſtance between the firſt treble and tenor, in four parts, ſhould never be more than a 10th.

Many of theſe rules are become obſolete, ſuch as the four firſt, the 6th, 7th, 8th, and 10th.

But of Padre Martini's ten rules of counterpoint, eight remain, even in ſecular muſic.

Though almoſt all theſe rules have been already given in the courſe of this article, we ſhall infer them here in regular order.

I. The firſt rule in counterpoint is to begin and end in perfect harmony with the ſounds that compoſe the common chord of the key-note, and their compounds or octaves.

II. Prohibits the ſucceſſion of two unisons, two octaves, or two fifths, in ſimilar motion.

III. Contains prohibitions in muſic, *a cappella*, which have been long aboliſhed in ſecular muſic; ſuch as the avoiding the leap of a ſharp 4th, or flat 5th, in melody; the major 6th, minor 7th, a diminished or falſe octave, muſt always be difficult to execute with the voice, and deteſtable to the ear.

IV. To remember that major intervals naturally aſcend, and minor deſcend; of the firſt kind are the 3d, 6th, and 7th major; and of the latter, the flat 5th and flat 7th.

V. Falſe relations prohibited.

VI. *Mi* againſt *Fa*, or the tritonus $\frac{B}{F}$. This prohibition, already given in the IIIrd. rule, has been taken off long ſince, in ſecular muſic; where the moſt expreſſive and impaſſioned paſſages have been produced by this interdicted interval.

VII. That the ſeveral parts ſhould be as compact and near each other as poſſible.

VIII. The paſſage from any conſonance to a perfect concord by regular motion, is prohibited. See in *Pl. IV.* Martini's examples, in which ſuſpicions of 5ths and 8ths appear.

IX. That *ſimple counterpoint*, or note againſt note, ought to be compoſed of concords only, and of notes of equal length.

X. In florid or *figurative counterpoint*, in which notes of different duration are uſed, there are two kinds of diſcords, the one by gradation, or *paſſing notes*; (which ſee,) the other by ſuch diſcords as are regularly *prepared* and *reſolved*, (which terms ſee in their places.)

A ſhort and intelligible rule for tranſient modulation from note to note in any given key, would be to ſay, that an accidental \sharp or \flat in any of the parts, changes the modulation to a new key; the ſharp, in ſharp keys, and the natural in keys with flats, lead to the half note above ſuch ſharp or natural. The accidental \flat in a major key with flats, and a natural in keys with sharps, lead to the 4th below in major keys; and in minor keys to the minor 6th below; as in C \flat a flat to B implies the key of F major or minor.

Of Padre Martini's ten rules of *counterpoint* the third and ſixth rules may be ſpared. His collection of paſſages that involve a *ſuſpicion* of 5ths and 8ths contains uſeful beacons.

Dr. Pepuſch ſeems beſt to have explained what is meant by *paſſing-notes*, which imply ſuch ſounds in the melody of any part, as are not in the chord to the baſe,

Double counterpoint has been more laboured in the new 4to. edition of the *Encyclopédie*, and has had more pages beſtowed upon it than any muſical article in that voluminous work. Calculations are made of the inverſion of all the intervals in this artful and ingenious Species of *counterpoint*, the moſt uſeful and pleaſing perhaps in figurative harmony. But of this, Sala has given ſuch numerous and excellent examples in his *Regole del Contrappunto*, that nothing more ſeems neceſſary on the ſubject. See an account of this admirable work in the biographical article concerning the author. However, after M. de Caſtilhon has beſtowed ten pages in the New *Encyclopédie* upon the *theory* of *double counterpoint*, M. Ginguené takes it up practically, and gives ten or twelve excellent examples of it in notation, from Padre Martini's *Saggio di Contrappunto*, who chiefly ſelected them from the works of Paleſtrina. For the hiſtory of counterpoint, ſee COMPOSITION.

COUNTER-POINTED, in *Heraldry*, by the French called *contre-pointé*, is when two cheverons in one eſcutcheon meet in the points, the one riſing, as uſual, from the baſe, and the other inverted, falling from the chief. They may alſo be counter-pointed the other way; that is, when they are formed on the ſides of the ſhield and the points meet that way, called counter-pointed in feſſe.

COUNTERPOISE, or COUNTERPOIZE, (from *counter*, oppoſite, and *poize*, a weight, or balance,) is a weight ſtanding in oppoſition to another weight. The word is principally uſed in *Mechanics*. When a weight is placed in each ſcale of a balance, ſo that neither of the two preponderates, each weight is ſaid to be a counterpoize to the other. And the ſame thing muſt be underſtood of all other mechanical engines; obſerving, however, that in every mechanical engine, the balance excepted, they are not the weights themſelves that muſt be equal, but their *momenta*; that is, the weight of each multiplied by its velocity. Thus, ſuppoſe that a wheel of two feet in diameter is fixed to an axis of one foot in diameter, and that a rope fallen with one of its extremities to the rim of the wheel, goes round it, and hangs down with its other extremity; alſo, that another rope faſtened with one end to the axis, goes round it in the oppoſite direction, and hangs down with its other end. Now if a weight of three pounds be faſtened to the end of the rope which proceeds from the wheel, and a weight of ſix pounds be faſtened to the rope which proceeds from the axis; each of thoſe weights will be a counterpoize to the other, and the wheel with its axis will, of courſe, remain motionleſs; for ſince the diameter of the wheel is two feet, and that of the axis one foot; their circumferences are in the ſame ratio; *viz.* that of two to one; therefore the weight of three pounds multiplied by the velocity two, produces the momentum ſix; and the weight of ſix pounds multiplied by the velocity one, produces the momentum ſix, *viz.* equal to the former.

When objects, eſpecially thoſe of a heavy and bulky kind, are properly ſituated upon whatever they ſtand: ſuch as ſtatues, men on horſeback, rope dancers, veſſels upon water, &c. they are ſometimes ſaid to be well poized, or properly counterpoized; meaning that they are ſo ſituated as to have as much weight, or rather momentum, on one ſide of the line of direction as on the other; hence they remain perfectly ſteady and firm. The line of direction of a body, is a line which paſſes through the centre of gravity of that body, and is perpendicular to the horizon.

Sometimes the word counterpoize is uſed to expreſs any inſtrument or any weight which may be occaſionally

ally used for the purpose of restoring the equilibrium of a body, or of a system of bodies connected together.

COUNTERPOISE, in the *Manege*, denotes the liberty of the action and feet of a horseman; so that in all the horse's motion he continues in the middle of the saddle, bearing equally on the stirrups.

COUNTER-POISON, an antidote or remedy, which prevents the effect of a poison.

Of this kind are Venice treacle, mithridate, orvietan, &c. *Counter poisons* are either *general*, or *specific*: to the general kind belong angelica, carduus benedictus, the vine-toxicum, dittany, scorzonera, citrons, bezoar, hartshorn, &c. For specifics, citron-bark is supposed a *counter-poison* to nuxvomica; Venice treacle to the bite of a viper; oil of scorpion to the bite of scorpions; oil of pine-apples to orpiment; gentian to the ecuta, &c.

Vander Linder, in his treatise *De Venenis*, says, that in every putrid indisposition, whether arising from the bite of venomous beasts, or from an aleali formed by putrefaction, vinegar drunk is sovereign, either simple or distilled; either with honey in form of oxymel, or with squills.

COUNTER-PLANT, in *Heraldry*, is reckoned as far as well ermine and vair; but is composed of such pieces as represent the tops of crutches, in French called *Potences*, and in old English *Potents*.

COUNTER-PRESSURE of fluids, (from *counter*, opposite, and *pressure*;) in *Hydraulics*, means the pressure which is produced by a stream of fluid in a direction opposite to its own, and which is rendered active when the reservoir, from which the stream issues, is moveable. Upon this principle mills and other machines have been contrived by Euler, Segner, and others. We shall endeavour to convey to our readers a clear idea of the counter-pressure of fluids, and of the general application of the principle to useful machines, by means of *fig. 5*, in *Plat. I. Hydraulics*. A B C represents a hollow vessel of wood, or tin, or iron, or, in short, of any substance sufficiently hard and durable. It has three apertures; *viz.* a large one C G, a small lateral aperture on one arm at B, and another lateral aperture equal to the last on the other arm, but on the other side of it, that is, opposite to A. The whole machine is fastened to an axis, the extremities of which turn in the holes D and E: this axis stands perpendicular to the horizon. F is a spout proceeding from a reservoir or spring, and continually pouring water into the aperture C G. Now, the water which thus comes into the vessel, finding the two apertures at B, and on the side opposite to A, comes out of the same, and forms two streams; then the opposition which the air offers to those streams produces a counter-pressure on the arms of the machine in a direction contrary to that of the streams; in consequence of which the whole machine is caused to turn round in the direction contrary to the streams, and this rotatory motion will continue as long as the spout, F, continues to pour water into the aperture C G. When a motion or moving power is thus obtained, the application of it to mills, pumps, and other engines, is sufficiently easy. Where a sufficient supply of water from a proper height may be had, a machine of this sort may be rendered very powerful; *viz.* by increasing the perpendicular height of the vertical tube and the length of the horizontal arms, and by enlarging the apertures on the arms, the power may be increased to a very considerable degree. In this machine the whole vessel, C G A B, is the moveable reservoir of the spouts at B, and opposite to A.

The wheels of fire-works, which are commonly exhibited, turn round their axis upon the same principle; that is, the stream of fire comes out in one direction, and the opposition which the air makes to it, produces a counter-pressure, which forces the wheel to turn round its axis in the opposite direction.

A well known electrical experiment, called the *electrical fly*, is another instance of this kind. The apparatus, which is particularly described amongst the electrical instruments, consists of three or four wires fastened to a cap, like the magnetic needle of a compass, which rests upon, and turns round, a vertical pointed wire. The extremities of the wires are turned sideways. When this little apparatus is electrified, the stream of electric fluid which comes out of the extremities of the wires forces the fly to turn in the opposite direction.

When an aeolipile is set upon a little wheel carriage, and its aperture is turned horizontally, the steam, which issues from it, produces a counter-pressure, (in consequence of the opposition which the air makes to it) which impels the aeolipile with its carriage into the opposite direction. See *ÆOLIPILE*.

COUNTER-PROOF, in *Rolling-press Printing*, a print taken off from another fresh printed; which, by being passed through the press, gives the figure of the former, but inverted.

To counter-prove, is also to pass a design in black lead, or red chalk, through the press, after having moistened with a sponge, both that, and the paper on which the *counter-proof* is to be taken.

COUNTER-QUARTERED. See *COUNTER-CARTELE*.

COUNTER-ROLL, a copy of the rolls relating to appeals, inquests, &c. stat. 3 Ed. I. c. 10. See *ROLLS*.

COUNTER ROUND, a particular round made by officers to know if a round ordered has been exactly performed.

COUNTER SALIENT, in *Heraldry*, expresses two animals leaping different ways.

COUNTER SCARP is, properly speaking, in *Fortification*, the slope or talus of the exterior side of a ditch; or it may be called the outside or outward edge of a ditch towards the field opposite to the rampart and parapet of the work behind the ditch. As the outward slope or talus of the rampart or the side of the ditch that looks towards the field is called the *escarpe*, or scarp, so by way of contradistinction the outward slope or side of the ditch opposite to this and looking towards the place is called counterescarp. And it goes by this name whether it have a talus or not, particularly if it be reveted. This term is also used in a more extended sense, and is employed to express the glacis, covert way, and talus or slope of the ditch, that looks towards the body of the place or the work opposite to it. For it is frequently said, that the besiegers have carried their lodgments upon the counterescarp when they are lodged on the covert-way.

COUNTER-SCARP, angle of the. See *ANGLE*.

COUNTER-SIGN, in the general acceptation of the term, means any particular word, such as the name of a place or person, which like the parole is exchanged between guards, entrusted to persons, who visit military posts, go the rounds, or have any business to transact with officers or soldiers in camp or garrison. It ought always to be given in the language best known to the troops.

COUNTER-SIGNING, the signing of an order or patent of a superior, in quality of secretary; to render the thing more authentic.

Charters, &c. are signed by the king, and *counter-signed* by a secretary of state, or the lord-chancellor.

COUNTER-Stratagem, or *Counter-Finiss*, is that by means of which the intended effect of another is prevented. *Contre-tinelle*, or *contre-ruse*, still goes by the appellation of *contre-mine*.

COUNTER-stroke, a *Surgical* term, explained under the article **COUNTER-Ligature**.

COUNTER-Swallow-Tail, or *Contre queue d'Hiroude*, or *Contre queue d'Hirondelle*. The *queue d'Hiroude* or *queue d'Hirondelle* is a term commonly applied in fortification to a detached work made in the form of a simple tenaille or swallow's tail and wider outwards towards the field than it is inwards at the gorge. The term *contre-queue d'hirondelle* is on the other hand applied to a detached work, which is also in the form of a tenaille, but is wider inwards at the gorge than it is outwards towards the field. The situation of the ground does not always admit of making the wings of a horn-work parallel to one another. When they approach each other inwards, or when it widens towards the field, this work is also frequently called a *queue d'hirondelle* or *swallow-tail*; and when its wings approach nearer to each other outwards or towards the field it is called a *contre queue d'hiroude work*, or *counter-swallow-tail*. When a swallow's tail has two tenailles it is called *bonnet a pretre*, or *priest's cap*.

COUNTER-Tally, one of the two tallies whereon any thing is scored.

COUNTER-Tenor, is one of the mean or middle parts of music: so called, as being opposite to the tenor. It is likewise applied to a voice which is of a higher pitch than the tenor, but lower than the treble. See **CONTRALTO**.

COUNTER Time, in the *Manege*, signifies the defence or resistance of a horse that interrupts his cadence, and the measure of his manege, occasioned either by a bad rider, or a malicious horse.

COUNTER-Time, or *Contre-Temps*, in terms of fencing, is said of two champions, who make a pass at each other at the same time and give an interchanged thrust alike fatal to both.

COUNTER-Time, in *Music*. See **CONTRE-TEMPS**.

COUNTER-Trenches, are trenches made against the besiegers to stop their going on with their trenches and to keep them as far from the place besieged as possible; it being well known that the farther the besiegers are from the place the less they can annoy it. As they are opposed to the besiegers' trenches or approaches, which have their parapets turned towards the place or the besieged, it is easy to conceive that the counter trenches must have their parapets turned towards the besiegers or the field, in order that the besieged may be covered by them. It is also evident, that they ought to be looked along and seen from different parts of the place to prevent their affording any cover or shelter to the besiegers, should they take them. They should be carried on to such places as are advantageous for the town and prejudicial to the enemy that they may be defended from the outworks without being enfiladed or commanded by any height, which the besiegers are in possession of, or are posted on.

Counter trenches are the same as **COUNTER-Approaches**, which see.

The phrase, *to pour the Trench*, is to make a vigorous sally against those that guard it, and force them to give way or to quit their post and lose ground, and to put the pioneers to flight.

COUNTER-Tripant, in *Heraldry*, has the same meaning

as *counter-passant*, but is only applied to different species of deer.

COUNTER-Vair, is when bells or cups of the same tincture are placed base against base, and point against point.

COUNTER-vallation. See **CIRCUMVALLATION**.

COUNTER-vention. See **CONTRAVENTION**.

COUNTER-Word, in *Military Language*, a second parole or counter-sign which is given in times of alarm.

COUNTER Working, in the *Military Art*, the raising of works, in order to oppose those of the enemy.

COUNTERLY, in *Heraldry*, is the ancient term for what we now call *Parted per pale*.

COUNTESS'S POWDER. See **SUFFOLK Powder**.

COUNTING, or **COMPTING-HOUSE**. See **COMPTING-HOUSE** and **GREEN-CLOTH**.

COUNTING-Board. See **ABACUS**.

COUNTORS, **CONTOURS**, or *Countors*, have been used for sergeants at law, retained to defend a cause, or to speak for their client in any court of law.

It is of these *Countors* speaks:

—A sheriff had he been, and a *countour*,

Was no where such a worthy varafour.

They were anciently called *sergeant-countors*. 1 *Init.* 17.

COUNTRIES, among the *Miners*, a term or appellation they give to their works under ground. *Phil. Trans.* No. 178.

COUNTRY DANCE is of English origin, though transplanted into almost all the countries and courts of Europe. There is no established rule for the composition of tunes to this dance, because there is in music no kind of time whatever which may not be measured by the motions common in dancing; and there are few tunes in any favour within the last century, that have not been applied to *country dances*. See **CONTRE-dance**.

COUNTRY Post. See **SHELF**.

COUNTRY Harbour, in *Geography*, a harbour of America, about 25 leagues to the eastward of Halifax in Nova Scotia.

COUNTRY, Trial by, the same with trial by jury. See **JURY** and **TRIAL**.

COUNTRY-Wales. See **WAKES**.

COUNTY, **COMITATUS**, originally signifies the territory of a count, or earl. But now it is used in the same sense with shire: the one word coming from the *comes*, the count of the Franks, the other from the Saxon and signifying a division.

In this view, a county is a circuit or portion of the realm; into fifty-two of which the whole kingdom is divided, for its better government, and the more easy administration of justice: England containing 40, and Wales 12 counties.

These counties are subdivided into rapes, lathes, wapentakes, hundreds; and these again into tithings: a division owing, as it has been said, to king Alfred.

For the execution of the laws in several counties, officers are appointed, under the denomination of *sheriffs*. See **SHERIFF**.

Other officers of the several counties are, a *lord lieutenant*, who has the command of the militia of the county: *custodes rotulorum*, *justices of peace*, *bailiffs*, *high constable*, and *coroner*. See farther under **LORD LIEUTENANT**, **MILITIA**, **CUSTOS rotulorum**, **JUSTICE of the peace**, **HIGH-CONSTABLE**, **BAILIFF**, and **CORONER**.

Of the fifty-two counties, there are three of special note, which are therefore termed *counties palatine*, as *Lancaster*, *Chester*,

C O U N T Y.

Chester, and Durham. The two latter are such by prescription, or immemorial custom, at least as old as the Norman conquest; the former was created by Edward III. in favour of Henry Plantagenet, first earl and then duke of Lancaster; whose heirs being married to John of Gaunt, the king's son, the franchise was greatly enlarged and confirmed in parliament (Cart. 36 Edw. III. n. 9.) to honour John of Gaunt himself, whom, on the death of his father-in-law, the king had also created duke of Lancaster. (Pat. 51 Ed. III. m. 33.)

Counties palatine are so called a *palatio*; because the owners thereof, the earl of Chester, the bishop of Durham, and the duke of Lancaster, had in these counties *jura regalia*, as fully as the king hath in his palace; *regalem potestatem in omnibus*, as Bracton expresses it. (l. iii. c. 8. § 4.) They might pardon treasons, murders, and felonies; they appointed all judges and justices of the peace; all writs and indictments ran in their names, as in other counties in the king's; and all offences were said to be done against their peace, and not, as in other places, *contra pacem domini regis*. These palatine privileges (so similar to the regal independent jurisdictions usurped by the great barons on the continent, during the weak infant state of the first feudal kingdoms in Europe) were in all probability originally granted to the counties of Chester and Durham, because they bordered upon inimical countries, Wales and Scotland; in order that the inhabitants, having justice administered at home, might not be obliged to go out of the country, and leave it open to the enemy's incursions; and that the owners, being encouraged by so large an authority, might be the more watchful in its defence. On this account there were also formerly two other counties palatine, Pembroke-shire and Hexhamshire, which last belonged to the archbishop of York, and was stripped of its privilege in the reign of queen Elizabeth, and reduced to be a part of the county of Northumberland; the former was abolished in 27 Hen. VIII. the latter in 14 Eliz.

In 27 Hen. VIII. likewise, the powers before mentioned of owners of counties palatine were abridged; the reason for their continuance in a manner ceasing:—though still all writs are witnessed in their names, and all forfeitures for treason by the common law accrue to them. 4 Inst. 205.

Of these three, the county of Durham is now the only one remaining in the hands of a subject. For the earldom of Chester, as Camden testifies, was united to the crown by Henry III., and has ever since given title to the king's eldest son. And the county palatine, or duchy of Lancaster, was the property of Henry of Bolingbroke, the son of John of Gaunt, at the time when he wrested the crown from king Richard II., and assumed the title of king Henry IV. But he was too prudent to suffer this to be united to the crown; lest, if he lost one, he should lose the other also. He therefore procured an act of parliament, in the first year of his reign, ordaining that the duchy of Lancaster, and all other his hereditary estates, with all their royalties and franchises, should remain to him and his heirs for ever; and should remain, descend, be administered, and governed, in like manner, as if he never attained the royal dignity; and thus they descended to his son and grandson, Henry V. and Henry VI.; many new territories and privileges being annexed to the duchy by the former. (Parl. 2 Hen. V. n. 30. 3 Hen. V. n. 15.) Henry VI. being attainted in 1 Edw. IV., this duchy was declared in parliament to have become forfeited to the crown (1 Ventr. 155.), and at the same time an act was made to incorporate the duchy of Lancaster, to continue the county palatine,

(which might otherwise have been determined by the attainder, 1 Ventr. 157.) and to make the same parcel of the duchy: and further to vest the whole in king Edw. IV. and his heirs, *kings of England*, for ever; but under a separate guiding and governance from the other inheritances of the crown. And in 1 Hen. VII. another act was made, to resume such part of the duchy lands as had been dismembered from it in the reign of Edw. IV., and to vest the inheritance of the whole in the king and his heirs for ever, as amply and largely, and in like manner, form, and condition, separate from the crown of England and possession of the same, as the three Henries and Edward IV., or any of them, had and held the same.

The isle of Ely is not a *county palatine*, though sometimes erroneously so called, but only a royal franchise: the bishop having, by a grant of king Henry I., *jura regalia* within the isle of Ely; by which he exercises a jurisdiction over all causes, as well criminal as civil. 4 Inst. 220.

The *counties palatine* are reckoned among the superior courts; and are privileged as to pleas, so that no inhabitant of such counties shall be compelled by any writ to appear or answer out of the same; except for error, or in cases of treason, &c.: and the counties palatine of Chester and Durham are, by prescription, where the king's writ ought not to come but under the seal of the counties palatine; unless they be writs of proclamation, (Crompt. Jurif. 137. 1 Danv. Abr. 750.) But *certiorari* lies out of B. R. to justices of a county palatine, &c. to remove indictments, and proceedings before them. (2 Hawk. P. C. c. 27. § 23.) There is also a court of chancery in the counties palatine of Lancaster and Durham, over which there are chancellors: that of Lancaster, called chancellor of the duchy. (See CHANCELLOR.) And there is a court of exchequer at Chester, of a mixed nature, for law and equity, of which the "Chamberlain of Chester" is judge. There is also a chief justice of Chester; and there are other justices in the other counties palatine, to determine civil actions and pleas of the crown.

The bishop of Durham has that county palatine; and if any erroneous judgment be given in the courts of the bishopric of Durham, a writ of error shall be brought before the bishop himself; and if he give an erroneous judgment thereon, a writ of error shall be sued out in B. R. (4 Inst. 218.) Infants in counties palatine are enabled to convey by order of the respective courts belonging to those counties. (4 Geo. III. c. 16.) The king may make a county palatine by his letters patent without parliament. (4 Inst. 201.)

COUNTY-Corporate, is a title given to several cities and towns, on which the English monarchs have thought fit to bestow extraordinary privileges; annexing to them a particular territory, land, or jurisdiction; and making them counties of themselves, so as not to be comprised in any other county; and to be governed by their own sheriffs and magistrates, without the interference of the officers of the county at large. The statute 3 Geo. I. c. 15, for the regulation of the office of sheriffs, enumerates 12 cities, and 5 towns, which are counties of themselves, and which consequently have their own sheriffs. The cities are, London (by grant of Hen. I.), Chester, (42 Eliz.), Bristol, Coventry, Canterbury, Exeter, Gloucester, Litchfield, Lincoln, Norwich, Worcester, York, (32 Hen. VIII.) The towns are, Kingston-upon-Hull, Nottingham, Newcastle-upon-Tyne, Pool, Southampton. To these Cirencester is added in "Impey's Sheriff;" but it does not appear on what authority.

COUNTY-Court. See *County COURT*.

COUNTY-Lieutenant. See LIEUTENANT.

COUNTY-Rates, are those ordered by justices of peace at their quarter-sessions, (and by justices of liberties and franchises, not subject to the county-commissioners, stat. 13 Geo. II. c. 18.) assessed on every parish, and collected by high-constables of hundreds, and paid to treasurers appointed by the justices, for repairing bridges, gaols, or houses of correction, on presentments made by the grand jury at the assises or quarter-sessions, of their need of reparation; but appeal lies by the church-wardens and overseers of the poor of the parishes to the justices at the next sessions, against the rate on any particular parish. 12 Geo. II. c. 29. As to the appeal, see 22 Geo. III. c. 17.

COUNTY, *Ricr.* See RIER.

COUNTY-Treasurer. See TREASURER and COUNTY-rates.

COVOLO, in *Geography*, a fortress of Germany, which defends an important pass between the country of Tyrol and Italy, with a garrison and stores.

COVORDEN, or COWORDEN, a city of the Netherlands, in Overijssel, the capital of Drent; one of the strongest places in the United Provinces, fortified in the form of a regular pentagon, with seven large bastions, called after the names of the provinces, seven half-moons, and seven ravelins; and besides, a fortress surrounded with five other bastions, and a double ditch, very large and deep; the ramparts are high and thick; and its situation, in the midst of a morass, renders the approach extremely difficult. It has frequently been taken and retaken by the Spaniards and the Dutch: 60 miles N. E. of Arnheim, and 45 S. of Embden. N. lat. 50° 42'. E. long. 6° 33'.

COUP, Fr. a touch or stroke. In *Music*, *coup de langue*, with flute players, is the accent given to notes by the tip of the tongue, instead of slurring them in an inarticulate manner.

Coup d'Archet, on the violin, is a stroke of the bow.

Coup de Bride, in the *Manege*. See EBRILLADE.

Coup de Grace, in the *French Music*, the same as what the Italians call *tronco per grazia*.

Coup de Main, Fr. A sudden and bold action or enterprise. As the success of a *coup de main* depends on secrecy and surprise, it should always be a primary consideration to get as near to the object you have in view as possible, without being discovered or suspected whether you go to it by land or by water. But if you intend to go by water to carry on war in any country, you should land at a distance from the object you have in view, in order to have time to bring your stores on shore, to fortify a camp, to take some capital position, and then proceed gradually towards the accomplishment of the main enterprise. See the articles PARTIES, PARTISANS, and PETITE *Guerre*.

Coup-d'Oeil Militaire, military glance of the eye, in *Military Tactics*, that fortunate aptitude or fitness of eye in a general or other officer, which enables him at one glance, as it were, to distinguish a strong from a weak, an advantageous from a disadvantageous position, and to see at once on the map the weak parts of an enemy's country as well as the strong ones on his own, or to discover immediately the nature and divers situations of a country in which he carries on war; by means of which he distinguishes between the advantages or disadvantages of posts, which he wishes to occupy, or which he thinks may be useful or useless to the enemy. A general, who possesses a ready *coup d'ail*, may surmount the greatest difficulties, particularly in offensive operations, and find resources in every situation. This faculty is of the greatest use even on a small scale. Actions have frequently been recovered by a conception of turning to account the smallest mistakes on the part of the enemy, which, during the rapid and often confused movements of

opposing armies, could only be discerned and ascertained by a quick and ready eye.

The military glance of the eye is reducible to two points or particulars. The first of these comprehends the talent or faculty of judging, at one view, what number of troops a certain piece of ground will contain. This is acquired by practice. After a person has marked out several camps, his eye will become capable of measuring so exactly, that he will seldom be mistaken in his estimate.

The other point, or talent, is of a superior nature, and consists in conceiving, at first sight, every possible advantage that the ground affords. This is sometimes considered as the gift of nature. But it may also be acquired by study, application, and an extreme desire to excel and do what is right. And by those, who are born with a happy genius for the art of war, it may, by means of study, be carried to a great degree of perfection. The chase is a good school for acquiring a just *coup d'ail*. John, duke of Marlborough, possessed it in an eminent degree, as did also marshal Luxembourg, and Louis XV., and several great captains or generals of the 16th, 17th, and 18th centuries. Frederic II., or the Great, expressly says, "that the basis of this glance of the eye is the knowledge of fortification, the rules of which are to be applied to every position of an army." An able and experienced general who possesses it, will avail himself of every height, enclosure, building, defile, hollow-way, morass, &c.

He also says, "that in the space of two square leagues, it may be possible to take two hundred different positions; that a good general will perceive at the first glance that which is most advantageous; that he will ascend every eminence in order to explore and reconnoitre the country: that the same rules of fortification will shew him the weakness of the enemy's order of battle; and that it is also of great importance, after he has taken his position, if time will permit, to know the precise extent of the ground which he occupies, and the number of paces it contains."

In speaking of the military glance of the eye, he likewise observes, "that there are many other advantages to be drawn from the rules of fortification; as, for example, to choose your heights, and to possess them in such a manner, that they may not be commanded by others; that your flanks may be covered and defended; that each post may be capable of defence; and to avoid those, in which a brave officer cannot maintain his ground without risking his reputation; that, by the same rules, you will be able to judge of the defects in the position of your enemy, whether they arise from the disadvantage of his situation, or the injudicious distribution of his troops.

COUPED, or COUPE'E, in *Heraldry*, a term used to express a head, or any other thing borne, cut off straight in opposition to its being torn off, which is called *crased*.

Thus, the arms of Ulster, which all baronets carry, is a dexter-hand *couped*, or cut off at the wrist.

COUPED, *Coupee*, is also used to denote such crosses, bars, ends, cheverons, &c. as do not touch the sides of the escutcheon, but are, as it were, cut off from them.

COUPE'E, a motion in dancing, wherein one leg is a little bent, and suspended from the ground; and with the other a motion is made forwards.

The word, in the original French, signifies a *cut*.

COUPE'E, or *Cut-point*, in *Geography*, a short cut in the river Mississippi, about 35 miles above Manchac fort, at the gut of Ibberville, and 259 from the mouth of the river. The Spanish settlements of Point Coupée extend 20 miles on the west side of the Mississippi; and there are some plantations on the side of La Fausse Riviere, through which the Mississippi passed about 70 years ago. The fort at Point

Coupeé is of a square form, having four bastions constructed with stockades. Some years ago, there were in these settlements about 2000 white inhabitants and 7000 slaves. They cultivate Indian corn, tobacco, and indigo; and they breed a large number of poultry, which they send to New Orleans. They also send to that city squared timber, shingles, &c.

COUPELLE, Fr. a sort of shovel of white iron or brass, necessary for cannoniers to handle, or manage the powder whilst they are filling cartridges with it.

COUPER, Fr. to *cut*, is a term in instrumental *Music*, equal to *scritto* and *staccato*, Italian, which see. It implies cutting the notes short, in opposition to *tenuto* and *legato*, Ital. and slurring, swelling, and sustaining in English. In rapid passages on the violin *couper* sometimes implies the letting the bow of the violin vibrate on the strings without pressure, which the Italians express by *spiccato*.

COUPERIN, FRANÇOIS, in *Biography*. So many musicians of the name of Couperin have distinguished themselves in France, for more than 200 years, that the family has rendered itself illustrious by its talents, particularly on the organ and harpsichord, and in composition.

Three brothers, Louis, François, and Charles Couperin, are the stock whence all the rest have sprung. Louis, celebrated for his abilities in his profession, was appointed organist to the king, and the place of treble viol was expressly created for him. He died about 1665, at the age of seventy.

François was also much celebrated for his excellent method of teaching the harpsichord; and Charles, the youngest of the three brothers, played the organ in a very superior manner: but dying in 1669, he left a son, François Couperin, only a year old, who became so eminent a musician, that he was entitled the Great Couperin, for his admirable performance on the organ; and the many lessons which he composed for the harpsichord, and which were universally known and admired in their day. He was organist to the king, and the church of St. Gervais, as well as chamber-musician to his majesty, and died in 1733. The females of this family were likewise such excellent performers on the harpsichord, as to be high in the favour of the court and the public.

Another François Couperin, cousin to the great Couperin, lived till 1778, and left a son, Armand Louis, who inherited his talents and fame, having succeeded to all his appointments; as that of one of the two organists of the king's chapel, and one of the four of Notre-dame, as well as organist of St. Gervais. He had, in 1780, a large family of sons and daughters, whose musical abilities bespoke their descent; some had already endeared themselves to the public by their performance, and others excited expectation for the future. Laborde. *Essais sur la Musique*.

The second François Couperin in 1713, printed two books of harpsichord lessons, that were of such difficult execution as to impede their sale, and to need a commentary. These he published in 1717, under the title *L'Art de toucher le Clavecin*—"The Art of Playing the Harpsichord." The whole, both examples and precepts, beautifully engraved on copper plates, folio. The French taste in music, at this time, was exclusively, that of Lulli, and truly national, to which the rest of Europe was not partial. Couperin's instructions, however, for forming a player on keyed-instruments, with respect to placing the scholar at the keys, the carriage of the person and the hand, with evolutions of fingering, or exercises to strengthen the hand, which, though written for his immediate scholars, and to facilitate the execution of his own printed lessons, are long since forgotten; yet, many of his precepts are still

useful and worthy of being adopted at the time of forming the hand, as they are applicable to the music of all times and all places. See FINGERING.

But we must not delude our readers with exaggeration of praise, or excite too great a desire to be in possession of a work now become scarce; but frankly own that though we approve some ingenious expedients in his method to lighten the hand, and multiply the fingers, there are rules for executing some common passages, that are at once inconvenient and clumsy. We shall extend our remarks on this work no further at present; but refer our readers to the articles DOUGHTER, Fr. (which Rousseau, even with the assistance of M. Duphy, has not rendered totally unexceptionable.) and FINGERING, Eng.

COUPIAC, in *Geography*, a town of France, in the department of the Aveyron, and district of St. Afrique.

COUPLE-CLOSE, in *Heraldry*, should contain the 4th part of a chevron; and is always borne in pairs, one on each side the chevron. The couple-close is to the chevron what the cottise is to the bend, and may be blazoned both ways, *viz.* a chevron between two couple-closes, and a chevron cottised.

COUPLED COLUMNS. See COLUMN.

COUPLET, Fr. formed from the Latin *copula*, a division of a hymn, ode, song, or the like, wherein an equal number, or equal measure, of verses is found in each part.

In odes, these divisions are more ordinarily called strophes.

This word which, usually, in English, is understood to imply a couple of lines or verses in poetry, which rhyme to each other; in Fr. is equivalent to strophe and stanza, in odes and ballads. In the latter, when many verses or stanzas go to the same tune, the poet should be careful that the accents fall on the same part of each verse. In many of our best ballads of this description, the accents frequently fall on such different portions of the stanzas, as by no means to suit the same melody. The poet, if he knows one tune from another, should write his first stanza to some well-known tune, and let that regulate the accents of the rest.

COUPLING-BOX, among *Mill-Wrights*, is a contrivance very frequently used in large mills, for quickly disuniting, or connecting, two parts of any shaft, which is to convey a rotatory motion from one part of a mill to another, in order to stop or put in motion any particular machine worked by that shaft.

Plate XVII. *Mechanics*, figs. 6, 7, and 8, represent three of the most common coupling-boxes. In fig. 6, A, B, represent the two shafts working in centres C, D, between which they are formed into two heads exactly like screw-heads, with a large notch across them; in the situation the drawing represents, they are quite independent of each other, and either of them may be turned round without moving the other, but they are easily united by driving a wedge, E, into the notch made in each head.

Fig. 7, represents another sort; the heads in this are square, and are connected by driving a loose square ring, E, over them both, and are disunited by knocking it back on to one of them, as in the figure; the square heads are a little tapering, so that the ring may fit tight when it is drove on.

In fig. 8, one of the heads, F, has two stubs projecting from it, which take into holes, made to correspond with them in the other G, and when they are to be joined the head of the shaft, F, is pushed up towards the other, by a lever, H, moving round a centre *a*; it has a fork at its end, which embraces a groove, cut in the head F. This

last coupling-box has the advantage of being able to be cast on, or off, without stopping the leading shaft, as the other two must, though it would be only for a short period.

COUPTRIN, in *Geography*, a small town of France in the department of Mayenne. It is the chief place of a canton, and contains 500 inhabitants. The canton itself has a population of 14,107 individuals in eleven communes, upon a territorial extent of 175 kilometres.

COUPURES, Fr. separations or cuts made in works attacked for disputing them inch by inch with the enemy. These in *fortification* are passages sometimes cut through the glacis of about 12 or 15 feet broad in the re-entering angles of the covert-way, to facilitate the fallies of the besieged. They are also made sometimes through the lower curtain, to let boats into a little haven built on the re-entering angle of the counterscarp of an outwork.

COUR, in *Geography*, a town of France, in the department of the Loir and Cher; 3 leagues S. E. of Blois.

COURA, a river of Portugal, which runs into the Duro; 4 miles N. E. of Lamego.

COURAGE, in *Ethics*, is that quality of the mind, derived either from constitution or principle, or both, that enables men to encounter difficulties and dangers. It is active *fortitude*, which meets dangers and attempts to repel them.

On this article it is unnecessary to say much, except by way of illustration as an essential *military* qualification. True courage is so much connected with fortitude or resolution of mind, which has always been justly classed among the virtues, that the ancients, particularly those, who were most accustomed to the study and practice of war, gave the same name or appellation to virtue and to valour. Thus virtue among the Romans, and ἀρετή, were terms employed to express both equally.

Without courage, both in the commander and in the troops commanded, military operations cannot, in cases of real difficulty and danger, prove successful. Soldiers may be sufficiently brave, without possessing, however, on all occasions, the courage necessary for making a display of their bravery. A general possessing talents, and a knowledge of human nature, (an acquaintance with which forms the first and principal ingredient in generalship), always knows in trying situations, how to inspire his troops with courage, provided they be well disciplined. Of this truth many instances might be adduced. Confidence in their leader never fails to give courage and resolution to troops. No commanders among the ancients possessed the confidence of their men more than Hamilcar Barca and his son Hannibal, and none perhaps among the moderns more than the celebrated Turenne, Maurice of Nassau, and John, duke of Marlborough. Every sort of trick, subtlety, and finesse is sometimes had recourse to for the purpose of elevating and raising the courage of soldiers. A general with an inferior number of troops who finds it impossible to avoid battle, by making his men believe, that the enemy will not give quarter or take prisoners, will generally succeed in animating them with a desperate species of courage. To shew and convince them also, that there are no hopes of safety but in victory, produces a similar effect. Of this there is a remarkable instance on record in modern history in the conduct of Ferdinand Cortes, who had only five hundred infantry and twenty horsemen for making the conquest of Mexico. Observing that his small force, which he was pleased to call his army, was alarmed at the great number of Indians assembled against them, he ordered his shipping to be set fire to. He was successful against the Mexicans. It must be allowed, however, that he only had to engage savages, who took his twenty horsemen for sea-

monsters, and the fire of musketry and artillery for thunder descended upon the earth. See **CORTES**.

Courage is a quality essentially requisite in the commander or leader of an army. For without it he cannot be self-possessed in the hour of difficulty and danger, or give his orders in the face of an enemy with coolness, precision, and distinctness. He will otherwise, when any unexpected or unforeseen occurrence takes place, become agitated, embarrassed, confused, and utterly at a loss how to act. We do not however mean to assert, that a general should ever be actuated by or under the impulse of such a headstrong, fierce, and ungovernable impetuosity, as spurns the control of reason, and despises precautions as unnecessary, which has often proved the ruin of both leaders and their armies, and generally leads to that absurdity of conduct, which arises out of ostentation, youthful folly, presumption, want of experience, or a contempt of the enemy, that is commonly dangerous or fatal. The commander of an army should keep himself, as much as it is possible, out of little combats, which decide nothing with respect to the whole or the issue of the enterprise in which he is engaged. And if ever any occasion should oblige him to take a part in such engagements, he ought to see many fall before he suffers the danger to approach himself. As all depends on him, he should remember the old proverb, "let the base Carian risk his life and not the general." But when the leader of an army exposes himself on every trivial occasion, he gives the strongest proof, he possibly can, of his want of both sense and capacity. He ought to be attentive both to his own safety and that of his army, which though it should suffer a defeat may be enabled through him, whilst he remains safe and unhurt, by a concurrence of favourable circumstances, to repair the loss that has been sustained. But as the hopes of every man under his command are centered in him, if he, who is, as it were, the pilot in a vessel, and the mover of the whole machine, falls, his army though superior to the enemy, perhaps in the action, may not be able to draw any solid advantage even from victory. How great soever his courage may be, he should never despise his enemy so much as on any occasion to neglect guarding against every thing like surprise. Among all the generals that have appeared in ancient and modern times, there is not one more entitled to admiration, on this account, than Hannibal, who, during the length of time, he waged war in a hostile country, without once dismissing his army from the field, amidst much variety of fortune, being sometimes pressed with difficult conjunctures, and involved in storms; and sometimes carried in his course by the most favourable gales, and notwithstanding the many and great battles he fought, as well as little combats, he was engaged in, and the sieges he undertook, though he often surprised his enemies, was never so much as once himself surprised. So great was the judgment and prudence with which he always provided both for his own safety and for that of his troops.

Though the general or commander of an army ought not to expose himself wantonly or unnecessarily, yet there are occasions and conjunctures, which imperiously require his throwing himself into danger, and call on him to prefer lasting fame, reputation, and honour to an inglorious and ignominious existence, which would naturally be the consequence of his dishonouring his former life and actions by a mean, unbecoming, or unreasonable desire of life. This doctrine is beautifully illustrated by Polybius in his account of the conduct of Afrubal the brother of Hannibal, who after crossing the Pyrenean mountains, and entering Italy with an intention to join his brother, fell in a battle he fought with the consuls Livius and Claudius. That sensible and judicious historian after observing, that most generals,

erals, when they are ready to engage in a decisive action, consider only the honour and advantages that may result from victory, but never turn their view towards the consequences of a defeat, or form for themselves any rule of conduct in case of a misfortune; and that many through such inattention have dishonoured all their former actions, and loaded the remainder of their lives with reproach and infamy, uses the following words: "But Asdrubal displayed a very different conduct. As long as any hope remained of his performing actions not unworthy of his former glory, he attended to nothing so much in every battle as the care of his own safety. But when fortune had taken from him every future prospect, and confined him to the last desperate extremity, though he neglected nothing that might secure the victory either in the disposition of his army, or in the time itself of the engagement; yet he considered also, with no less attention, in what manner, in case that he should be defeated, he might submit with dignity to his adverse fortune, and not suffer any thing unworthy of his former actions. Let other commanders then be taught by this example; as on the one hand not to frustrate the hopes of those who depend on them, by throwing themselves unnecessarily into danger; so on the other never to add disgrace to their misfortunes by cherishing an immoderate desire of life."

COURANT, or **CURRENT**, a term used to express the present time: thus, the year 1808 is the *courant* year; the fifteenth *courant*, the fifteenth day of the month now remaining.

The term is French, and properly signifies *running*.

With regard to commerce, the *price courant* of any merchandise, is the known and ordinary price accustomed to be given for it.

COURANT is also used for any thing that has course, or is received, in commerce: in which sense, we say, *courant*, or *current*, coin, &c.

COURANT is also a term in *Music* and *Dancing*; being used to express both the tune or air, and the dance.

With regard to the first, *courant*, or *current*, is a piece of music in triple time; the air of the *courant* is ordinarily noted in triples of minims; the parts to be repeated twice. It begins and ends, when he who beats the measure falls his hand; in contradistinction from the *faraband*, which ordinarily ends when the hand is raised. With regard to dancing, the *courant* was long the most common of all the dances practised in England: it consists, essentially, of a time, a step, a balance, and a couple; though it also admits of other motions.

Formerly they leaped their steps; in which point the *courant* differed from the low dances and pavades. There are *simple courants*, and *figured courants*, all danced by two persons. See **CORANTO**.

COURANT, *Current*, or *Cursant*, an heraldic term to express a horse or any other animal in full speed.

COURANTIN, Fr. a squib; a term used by French artificers.

COURAP, in *Medicine*, the Indian name for a distemper, which, as Bontius informs us, is very common in Java and other parts of the East Indies. It is a sort of herpes or itch, which generally breaks out on the arm-pits, breast, groin, and face, with such an intolerable itching, that the persons affected cannot forbear scratching themselves perpetually: but they pay very dear for the ease this gives them; as an insufferable pain succeeds in those parts which are rendered bare and denuded of the cuticula by the nails; these discharging an acrid humour which vellicates the parts, and causes the men to adhere so fast to them, as not to be separated without tearing the crust formed thereon.

Courap is a general name for any sort of itch, but the inhabitants call this distemper thus by way of eminence. It is so extremely contagious, that very few escape it; and though it is an unseemly disorder, causing a roughness of the skin with scales and furfures, yet the inhabitants imagine it is attended with this advantage, that while a person is affected with it, he is sure to be troubled with no other dangerous distemper: and they look upon the disappearing of this, as a prognostic of some worse disorder. They are therefore very easy under it for years together, without being very solicitous about curing it. It is remarkable that the vulgar in Scotland are possessed of the same opinion with respect to the itch; and even carry it so far as to affirm, that the catching this distemper proves a cure for any other previous to it; considering it in the same light as others do the gout, and perhaps with equal foundation. James.

COURAYER, PETER FRANCIS, in *Biography*, a learned French divine, born at Vernon in Normandy, in 1681. Of his early life we have no certain account. As a writer one of his publications was a dissertation on the Vainness of English Ordinations, which he undertook to defend, in two vols. This work was published in 1723. It was printed at Nancy; but not being able to obtain the requisite licence, it was sent forth to the world as from the Brussels press. The author was violently attacked by several writers in the church of Rome, to whom he replied in 1726. His original treatise and the defence were both translated into English, and so highly were they esteemed, that the university of Oxford readily conferred on M. Courayer the degree of doctor of divinity. The honours conferred upon him here excited the wrath of his own countrymen, who were resolved to compel him to recant his opinions; but he chose rather to quit his country than risque a persecution in defence of sentiments, which he had formed on deliberation. In his escape from France he was aided by the exiled bishop Atterbury, and, in 1728, he arrived in England, where he met with every attention and kindness that he had anticipated. Besides the liberality which he experienced from individuals, he obtained a pension of 100*l.* from the court. In 1729 he published at Amsterdam, a vindication of his opinions and conduct, explaining the reasons, and setting forth the necessity he was under of quitting France. At the command of queen Caroline, the steady friend, and liberal patron of literary merit, he undertook a French translation of father Paul's "History of the Council of Trent, with Notes critical, historical, and theological, in 2 vols. folio." This work proved a source of considerable profit to the translator, and his pension was now doubled, so that he found himself in very easy circumstances. He was moreover held in very high estimation by persons of the first rank, whose houses were ever open to him, and who were best pleased when they had an opportunity of rendering him that attention which his talents and virtues merited. He died in 1776 at Westminster, in the 95th year of his age; having been a resident in England almost half a century. In his last will he declared, "that he died a member of the church of Rome." He left however a manuscript, entitled "Declaration des mes derniers sentimens sur les differens dogmes de la Religion," which was given by him to the princess Amelia, who bequeathed it to Dr. Bell, prebendary of Westminster, by whom it was published in 1787, and which would lead to a very different conclusion. In this, Courayer rejects the commonly received opinion of the Trinity, and appears to hold sentiments very similar to those maintained by the modern Unitarians: he disavows also the plenary inspiration of the Scriptures, which he confines to the doctrines and precepts contained in them, without extending it to the relation of historical facts.

Many other sentiments contained in these last words of the excellent doctor, prove him to have been almost, if not altogether, a real protestant, though perhaps not aware himself to what extent his confessions had led him. Biog. Britan.

COURBAN-ΑΓΑΤΟΥ, in *Geography*, a port of Chinese Tartary, in the country of the Kalkas. N. lat. 42° 24'. E. long. 107° 48'.

COURBARIL, in *Botany*, Plum. See HΥΜΕΝÆΑ.

COURBES DE, JEAN, in *Biography*, an engraver, born in France, about the year 1592. Few of his works are known, and those which we do possess do not impress us with a high idea of his abilities. He worked chiefly for the booksellers, both in France and in England. In the latter country he engraved his small octavo plates, one of sir Philip Sydney, the other of sir Philip's sister, Mary countess of Pembroke, with an eulogium in French verse at the bottom of each portrait. These, probably, are from his own designs, as they are marked *J. de Courbes fecit*. The time of his death is not known. Huber. Strutt. Heinecken.

COURBEVILLE, in *Geography*, a town of France, in the department of the Mayenne; 7 miles S.W. of Laval.

COURBIERES, a village of France, in the department of the Lower Alps, formerly a lordship, from which the veteran Prussian field-marshal *L'homme de Courbières*, who distinguished himself at the defence of Graudentz against the French in 1807, derives his name.

COURCELLE, a town of France, in the department of the Straits of Calais, and district of Arras; 2 leagues N.W. of Bapaume.

COURCELLES, a town of France, in the department of the Upper Marne, and district of Langres; 4 leagues S. of Langres.

COURCELLES, STEPHEN DE, in *Biography*, descended from a family in Picardy, was born at Geneva in 1586. He officiated many years among the reformed in France, till he became a follower of Arminius, when he was obliged to retire into Holland. He succeeded the celebrated Episcopius as professor of theology at Amsterdam, whose works he published, with a life of the author. He was also the author of many theological and controversial pieces, which were afterwards collected by Elzevir in 1675. He was a capital Greek scholar, and paid great attention to different Greek copies of the New Testament, of which he gave a new edition, with various readings; and a preface, to shew that those various readings, though numerous, do not tend in the least to affect the credit and authenticity of the work itself. Moreri.

COURCHAMP, in *Geography*, a town of France, in the department of the Maine and Loire, and district of Saumur; 1½ league S.W. of Saumur.

COURCÎTE, a town of France, in the department of the Sarthe; 20 miles S.W. of Le Mans.

COURCON, a small town of France, in the department of the Yonne. It is the chief place of a canton, and has a population of 1204 individuals; but the canton reckons only 5796 inhabitants, in nine communes, and upon a territorial extent of 217 kilometres and a half.

COURCON, Fr. in *Gunnery*, a long and strong piece of iron, which is laid along the moulds of pieces of cannon, and which serves to bind and tighten them.

COURCOUSON, in *Geography*, a town of Asia, in the country of Thibet; 45 miles N.E. of Tofun-Hotun.

COURDEMANGE, a town of France, in the department of the Marne, and district of Vitry; one league S. of Vitry.

COURE, a port of Chinese Tartary, N. lat. 46° 2'. E. lon. 123° 51'.

COUREURS, Fr. Scouts. Horsemen or cavalry detached to scour the country, and reconnoitre the enemy. This term is also applied by way of reproach to those who on a march separate themselves, or withdraw from the rest of the troops for the purpose of marauding.

COURGAINS, in *Geography*, a town of France, in the department of the Sarthe, and district of Mamers; 6 leagues N. of Le Mans.

COURGIS, a town of France, in the department of the Yonne; 5 miles E. of Auxerre.

COURGIVAUX, a town of France, in the department of the Marne; ¾ leagues S. of Sezannes.

COURGUA, a town of Piedmont, in the Canavefe, seated on the Orco; 9½ miles S.W. of Ivrea.

COURIER, or CURRIER, from the French *courir*, to run; a messenger sent post, or express, to carry dispatches.

Antiquity, too, had its couriers; we meet with two kinds, viz. those who ran on foot, called by the Greeks *hemerodromi*, q. d. *couriers of a day*. Pliny, Corn. Nepos, and Cæsar, mention some of these who would run twenty, thirty, thirty-six, and, in the circus, even forty leagues per day. And riding couriers, *cursores equitantes*, who changed horses, as the modern couriers do.

Xenophon attributes the first couriers to Cyrus, as we have already stated under the article ANGARI, to which we refer for the history of their introduction.

But it does not appear, that either the Greeks or Romans had any regular fixed couriers, till the time of Augustus; under that prince they travelled in carts; though it appears from Socrates, they afterwards went on horseback. Under the western empire, they were called *viatores*; and under that of Constantinople, *cursores*; whence the modern name. See POST.

COURIER, in a *military sense*, signifies a messenger sent post or express to carry dispatches relative to battles fought, gained, or lost, to marches, sieges, blockades, and other occurrences in time of war.

COURIERS *des vivres*, Fr. These were two well informed, active, and expert messengers attached to the French army. They were found to be very useful in carrying packets of importance to and from places, and in taking charge of transporting and escorting pecuniary remittances or sums of money.

COURIERS, *Extraordinary*. See EXTRAORDINARY.

COURIERS *Muets*, Fr. Dumb or mute couriers. See the articles HEMERE'SCOPI, HEMERE'DROMI, and TELEGRAPH.

COURIERS, *Van*. See VAN *Couriers*.

COURIMARI, in *Botany*. Lam. Enc. Aubl. Guian. Sup. 28. tab. 384. (Ouleman Barr. Fr. Equin. 84.) A large tree. *Roots* several, rising separately, and at a distance from each other, six or seven feet above the surface of the ground, and sometimes fifteen feet broad towards the base; uniting at the top, and supporting the trunk. *Trunk* about eighty feet high, and four in diameter, with a cracked, wrinkled, thick, brown bark; branches large, numerous, from the summit of the trunk. *Leaves* five inches long and three broad, alternate, oval, entire, green, and even-surfaced above, villous and reddish underneath, with prominent nerves; petioles near an inch long, channelled. *Flowers* in short axillary racemes; calyx deeply divided into five acute segments; petals five, lanceolate, alternating with the divisions of the calyx; stamens not known; germ superior. *Fruit* not seen by Aublet in a state of maturity, spherical, about the size of a plumb, five-celled. *Seeds* one in each cell. A native of Guiana. The inhabitants smoke their tobacco wrapped

wrapped up in the thin laminae of the bark, which serve them instead of a pipe.

COURLAN, or COURLINI, in *Ornithology*, names given by Buffon to the scolopaceous heron of Latham, and *ARDEA scolopacea* of Gme in; the specific character of which is as follows: it is brown, its throat and breast streaked with white, its chin and legs white; its tail and its wing-quills have a coppery gloss. It is found in Cayenne.

COURLAND, in *Geography*, a province of Russia in Europe, situated between E. long. $21^{\circ} 26'$, and between N. lat. $56^{\circ} 30'$, and $57^{\circ} 30'$, which forms a separate government, and consists of Courland, properly so called, Semigallia or Sengallen, and the district of Pilten, is bounded by the river Dwina and the gulph of Riga, which divides it from Livonia, or the government of Riga, on the east; by Samogitia on the south and west; and by the Baltic sea on the north. It is 250 miles long, and from 80 to 40 broad.

The name Courland, or in the language of the country, *Cur, Kur*, or *Jubr Semne*, signifies a maritime country, or a tract of land that projects into the sea.

The climate of Courland is not so insupportably cold as that of the more eastern parts of Russia. Its soil in general is heavy. Hence the roads are remarkably bad, and at some seasons of the year scarcely passable. The country is mostly open, yet in some parts clothed with forests of pine and fir, dotted with occasional groves of fine oak, and sprinkled with much underwood. The villages are neat; the scattered cottages and gentlemen's seats are prettily situated amidst clumps of trees; and the inns afford superior accommodation to those of Russia.

Courland produces great quantities of corn, hemp, and flax, which constitute its principal exports. Amber is found on the coast of the Baltic. It has some iron mines, several mineral springs, and quarries of stone and chalk.

The principal rivers are the Windau, which rises in Samogitia, and empties itself into the Baltic sea, near the town of Windau; and the Aa, which has likewise its source in Samogitia, and falls into the gulph of Riga. These two rivers are navigable, and divide the country from east to west. Several small rivers as the Abau, Berse, Bartau, Mussa, Anger, and some brooks and canals, intersect it in every direction.

Mittau is the capital of Courland, and the seat of the Russian governor. There are also two ports on the Baltic; Windau, which had anciently a dock for building men of war, and Labau, the harbour of which has, however, not sufficient depth for ships of great burthen; they must be unloaded in the road. These two ports employ annually from 800 to 1000 vessels of two, three, and four hundred tons.

The inhabitants of Courland are descended partly from Germans, and partly from Lettonians or Lettes, whose language is still spoken by the lower orders: but German may be considered as the language of the country. The population is supposed to exceed a million and a half. The prevailing religion is the Lutheran, which was introduced in the year 1522: but all other persuasions are tolerated; and even before Courland was annexed to the Russian empire, the Roman Catholics were capable of holding all military and civil offices, that of chancellor and a few others excepted.

Courland, when a duchy, was a male fief, dependant on, and conferred by the crown of Poland. It anciently belonged to Livonia, and, till the thirteenth century, underwent the same vicissitudes with that country, both being subject to the knights of the Teutonic order, who remained in possession of Livonia and Courland, till the year 1561,

when, to frustrate the attempts of the czar Ivan II. to recover these provinces, which had been torn from the Russian empire, Gotthard Kettler, grand-master of the Livonian knights, ceded Livonia to Poland, and received at Wilna the investiture of the duchy of Courland and Semigallia, as an hereditary fief of the crown of Poland. At his death, which happened in 1587, Gotthard Kettler, the first duke of Courland, was succeeded by his son Frederick; and in 1589 it was enacted by the diet of Poland, that, on the extinction of the heirs male of the line of Kettler, the duchy should be united to Poland.

Frederick William, duke of Courland, dying in 1711, without issue, the right of succession devolved on his great uncle Ferdinand, the only surviving branch of the Kettler line: but Peter the Great of Russia took possession of Mittau, and great part of Courland, under pretence of securing the dowry for his niece Anne, widow of Frederick William. Ferdinand, who was absent, and at variance with his nobility, was unable to enforce his right, and Courland was for several years governed by the Russian court, under the name of the duchess Anne. Ineffectual attempts were made to raise, first, a prince of the house of Saxony, and afterwards Frederick William, margrave of Brandenburg Schwedt, to the ducal throne. At length the nobles being determined in 1726 to appoint a successor to Ferdinand, who was still absent, Augustus II. king of Poland, secretly influenced the diet to nominate his natural son Maurice, better known as marshal de Saxe. This appointment was contested by the republic of Poland, and by Catharine I. empress of Russia.

The Polish diet, which assembled at Grodno, denied the right of the nobles to appoint a duke, declared Courland a vacant fief belonging to the republic, annulled the election of the Comte de Saxe, and proposed, on the death of Ferdinand, to incorporate the duchy with the crown, according to the edict of 1589.

Catharine opposed both the election of Maurice, and the incorporation of Courland; and prince Mentchikof, who on her death aspired to the ducal throne, dispatched a corps of Russian troops to Mittau, and drove Maurice from Courland. The fall of Mentchikof prevented his nomination; but the Russians under Peter II. and Anne, maintained their influence in Courland, and promised to support the states in their right to elect a sovereign on the decease of Ferdinand.

The death of Augustus II. annihilated the hopes of Maurice. On the demise of Ferdinand, in 1737, the empress Anne forced the states to nominate her favourite, Biron. A convention was signed between the empress and the new duke on one side, and the king and republic of Poland on the other, called *Pacta Subjectionis*, or Acts of Vassalage, which established the succession in the male line of Biron. In 1739 the chancellor of Courland did homage, in the name of the duke, to Augustus III. king of Poland. But Biron being imprisoned in the year 1740, the states declared the ducal throne vacant, and elected, at the recommendation of the regent Anne, Louis Ernest, prince of Brunswick Wolfenbuttel, and brother to her husband.

The revolution of 1741, which placed Elizabeth on the throne of Russia, prevented the ratification of this election. Till 1759 the administration was nominally vested in the council of state, but the whole power centered in the court of Russia.

Disguised with the arrangement, the nobles in 1758, chose Charles Christian, son of Augustus the Third of Poland, who obtained from the empress Elizabeth, the restitution of the duchy. But the death of Elizabeth, which hap-

pened in 1761, rendered this restitution ineffectual. Peter recalled Biron from exile, and Catharine II. restored him to his former dignity.

In 1763, Ernest John Biron, duke of Courland, and Semigallia, repaired to Mittau twenty-eight years after his election, and for the first time since he had been raised to the ducal throne.

This Ernest John Biron, was descended from a family of mean extraction. His grandfather, whose name was properly Biren or Bieren, had been head groom to James the Third, duke of Courland, and his father master huntsman to the same prince.

Biron was born in 1687, received the early part of his education in Courland, and was sent to the university of Königsberg in Prussia, from which he was compelled to retire for some youthful imprudences. In 1714, he repaired to St. Petersburg, and vainly solicited the place of page to princess Charlotte. He then retired to Mittau, and through count Bestuchef, master of the household to Anne, widow of Frederick William duke of Courland, obtained the office of gentleman of the chamber to the duchess. His handsome figure soon made him her chief favourite, and his ascendancy over her was so dreaded, that when Anne was declared sovereign of Russia, the council of state stipulated that she should not bring Biron into Russia. But the empress was not long in violating her promise, and, incited by Biron, she assumed a despotic authority. Within the space of a few months, Biron was appointed gentleman of the bed-chamber, knight of the order of St. Andrew, and lord high chamberlain. He not only became omnipotent under her reign, but even at her death he secured the regency to the exclusion of Anne, mother to the young emperor Ivan. His power, however, lasted only twenty days. He was arrested, conveyed to the fortrefs of Schlüsselburgh, and afterwards removed to Pelm, a small town in Siberia, where he was imprisoned in a wooden hovel, and from whence the empress Elizabeth transferred him to a comfortable house at Yaroslaf. On her demise, Peter the Third recalled Biron to Petersburg, and soon after this emperor's fall, Catharine the Second restored the duke of Courland to his former dignity.

Prince Charles of Saxony, although supported by a large party in Courland, yet obtaining no assistance from his father, Augustus the Third, was compelled to retire before the Russian forces. Biron received the oath of allegiance from the whole nation. In 1764, he obtained from the king and republic of Poland, the investiture of Courland for his eldest son Peter, and abdicated the ducal throne five years after in his favour; and, in 1772, closed, at Mittau, in the eighty-third year of his age, a life of unparalleled vicissitude.

Soon after the conquest and final division of Poland, Peter, duke of Courland, repaired to Petersburg, had an audience of Catharine II. on the 12th of March 1795, and was received with the highest honours. During his absence, the states of Courland assembled, and the nobles proposed to declare the two duchies of Courland and Semigallia absolved from their feudal dependence on Poland, and to annex the country to the empire of Russia. The principal members of the great council opposed this change; but the Russian general Pahlen appeared in the assembly. His presence silenced all objections. On the 18th of March 1795, an act was drawn up, by which Courland, Semigallia, and the district of Pilten, were surrendered to the empress of Russia. The act was sent to Petersburg, and the submission of the states accepted by the empress. The duke, who

was in no condition to refuse his acquiescence, issued his act of renunciation on the 28th of March 1795. He was amply rewarded for the resignation of his duchy, and grieved little at its loss, as he had long been at variance with his subjects, and scarcely ever resided at Mittau. He had even foreseen his misfortune, and secured large sums of money, with which he purchased the duchy of Sagan, and other estates in the Prussian part of Silesia, and in the Mark of Brandenburg. See SAGAN. Coxe's Travels in Poland, Russia, &c. fifth edition, vol. ii. Tooke's View of the Russian Empire, vol. i. Mirabeau. Hist. Secrete de la Cour de Berlin, vol. i.

Courland, as a province of the Russian empire, forms a government divided into nine circles, or districts, and belongs to the northern region of Russia.

COURLE, a town of France, in the department of the Two Sevres; 5 leagues S. W. of Thouars.

COURLETT, in *Heraldry*, the same as cuirass, a breast-plate.

COURLIN ISLANDS, in *Geography*, two small islands near the W. coast of Scotland; 4 miles E. from the island of Scalpa.

COURLIS, in *Ornithology*, a name given by Buffon to several species of *tantalus* and *scelopax*; which see.

COURMETOU, in *Geography*, a town of Asia, in Tibet; 22 miles W. of Orto.

COURMENTERAL, a town of France, in the department of the Herault; 5 miles W. of Montpellier.

COURNILLION, a town of France, in the department of the Drôme; 4 leagues S. of Die.

COURNON, a town of France, in the department of the Puy-de-Dôme, and district of Clermont; 2 miles W. of Billom.

COURONDI, in *Botany*, Lam. Enc. Rheed, Mal. 4. 103. tab. 50. (*Arbor indica*; Rai. hist. 1664.) A lofty evergreen tree, with a thick trunk, and dark coloured rugged bark. *Leaves* opposite, oval-lanceolate, sessile, slightly crenate, smooth, shining. *Flowers* small, yellowish green, resembling those of the vine, from three to five together, in axillary corymbs; petals five, roundish; stamens numerous; germ superior. *Fruit* a round purplish berry or drupe, with thick, soft, saffron-coloured flesh, containing a nearly spherical stone. A native of the coast of Malabar. The juice of the leaves is altringent, and taken warm, mixed with whey, is said to cure diarrhoeas and dysenteries.

COURONNE, LA, in *Geography*, a village of France, in the department of Charente, three miles S. W. of Angoulême, on the Bourdeaux road; contains the principal of nineteen paper manufactures on the rivers Bohême and Charrau, the waters of which have the singular property of making capital paper.

In these manufactories is made that fine writing paper which is equal to the best Dutch and English, and which is exported in large quantities by the name Angoulême paper.

COURONNE', in *Heraldry*, crowned. A bend is said to be couronné, when it has on the upper edge the leaves of a coronet.

COUROUCOU, in *Ornithology*, a name given by Buffon to several species of the TROGON of Gmelin; which see.

COUROUCOUCOU, a name given by Buffon to the red-crested cuckow of Latham, and *Cuculus brasiliensis* of Gmelin; which see.

COUROULLAC, in *Geography*, a town of Asia, in Tibet; 12 miles S. W. of Harchar.

COURPIAC, a town of France, in the department of the Gironde, and district of Cadillac; 9 miles N. E. of Cadillac.

COURPIERRE, a small town of France, on the river Dore, in the department of Puy-de-Dôme, chief place of a canton in the district of Thiers. It has 3168 inhabitants, and the canton contains, in seven communes, and upon a territorial extent of 235 kilometers, a population of 14,193 individuals.

COURS, a place of little note in Dar-fâr, in Africa, N. W. by W., at 5½ hours travelling from Cobbé.

COURSAN, a small town of France, on an arm of the river Aude, in the department of Aude, three miles north of Narbonne. It is the chief place of a canton in the district of Narbonne, and has a population of 1435 individuals. The canton contains 6642 inhabitants, and seven communes, upon a territorial extent of 295 kilometers.

COURSE, is the direction (or *route*) of any thing in motion. This word has, therefore, been extensively used to denote the progress of any thing, as being analogous to the motion of an object which is continually changing its situation, as well as the track which has been run through. Hence we hear of the course of a ship at sea, the course of the law, a course of lectures, the course of rivers, and so forth. It is also used in architecture, where it denotes a continued range of stones or bricks at the same level, all along the side of a wall or building. The course of a vessel at sea, is expressed by the angle which the direction of the vessel's motion makes with the meridian; thus they say that the ship A took its course westward or eastward, or south-south-eastward, &c.

Course of rivers means their direction or their length. The numerous advantages which mankind derives from the rivers which the Creator of every thing has providentially dispersed throughout the surface of the earth, have rendered it necessary to examine every thing that belongs to them, in order that they may be rendered more securely subservient to a variety of purposes. The particulars which are here alluded to, concern the salubrity of the waters of rivers, their quantity, the rapidity of their motion, the fluctuating increase and decrease of their velocity, and so forth; a thorough knowledge of these matters being necessary for the proper use of the waters, for the erection of water-mills, and other machines, for inland navigation, for preventing inundations, &c. &c. But a full account of these things will be found under the article RIVER. The only particular which we shall introduce in this place, as peculiarly belonging to this article, is a statement of the proportional lengths, or courses of some of the most noted rivers in the world, a list of which, by approximation, was given by Mr. Rennell in the 71st vol. of the Phil. Transf. and which we shall now subjoin. In this table, the length of the river Thames, from its source to its estuary in the channel, is made a unit, and the lengths of the other rivers are called four, or five, or nine, according as they are four, or five, or nine times as long as the Thames.

European Rivers.

Thames	-	-	-	1
Rhine	-	-	-	5¼
Danube	-	-	-	7
Wolga	-	-	-	9½

Asiatic Rivers.

Indus	-	-	-	5¾
Euphrates	-	-	-	8½
Ganges	-	-	-	9½
Burrampooter	-	-	-	9½
Nou Kian, or Ava River	-	-	-	9½
Jennitea	-	-	-	10
Oby	-	-	-	10½
Amoor	-	-	-	11
Lena	-	-	-	11½
Hoanho (of China)	-	-	-	13½
Kian Reu (of ditto)	-	-	-	15½

African River.

Nile	-	-	-	12½
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American Rivers.

Mississippi	-	-	-	8
Amazons	-	-	-	15¼

If the length of the Thames, taking all its windings into the account, be reckoned equal to 300 miles, which is not very far from the truth, the prodigious lengths of some of the other rivers may be easily calculated; and it will be found that the length of the Jennitea is about 3000 miles, the length of the Amazons river is about 4575 miles, and so forth.

COURSE, in *Navigation*, the point of the compass, or horizon, on which a ship steers; or the angle which the rhumb-line on which it sails makes with the meridian.

When a vessel begins its course, the wind wherewith it is driven, makes a certain angle with the meridian of the place; and, as it is here supposed, the vessel follows exactly the direction of the wind; it makes the same angle with the meridian which the wind makes.

The wind is further supposed always the same; and because each point, or instant of a course, may be regarded as the first; every moment of the course it makes the same angle with the wind.

Now a wind that is north-east, *v. gr.* here (and by consequence makes an angle of forty-five degrees with our meridian), is north-east wherever it blows, and makes the same angle of forty-five degrees with all the meridians it meets.

The course of a vessel, therefore, driven by the same wind, makes the same angle with all the meridians on the surface of the globe.

If the vessel runs north and south, it makes an angle infinitely small with the meridian, *i. e.* is parallel to it, or never goes from it; if it runs east and west, it cuts all the meridians at right angles. In the first case it describes a great circle; in the second, a great circle, which is either the equator or a parallel. But if the course be between the two, it does not then describe a circle; because a circle drawn in such a manner, would cut all the meridians at unequal angles. It describes, therefore, a spiral or curve, the essential condition whereof is to cut all the meridians under the same angle; called the *loxodromic curve*, or *loxodromy*, popularly *rhumb*.

The ship's course, therefore, except in the two first cases, is always a loxodromic curve; and the hypothenuse of a right-angled triangle, the two other sides whereof are the ship's way in latitude and longitude.

The latitude is usually had by observation.

The rhumb, or angle of the course, is had by the compass, together with the one or other of the two sides; and what remains to be calculated in sailing, is the quantity of the longitude, and of the rhumb, or course.

COURSE, complement of the. See **COMPLEMENT**.

COURSE of Crops, in Agriculture, signifies the order or course in which crops are cultivated on tillage lands, or what is frequently termed the rotation of crops. See **CROPS, course of**.

COURSE of a River. See **COURSE and RIVER**.

COURSE, in Architecture, denotes a continued range of stones or bricks on a level, throughout the whole length of a building. See **BUILDING, WALL, and MASONRY**.

COURSE of Plinths, is the continuity of a plinth of stone, or plaster, in the face of a building; to mark the separation of the stories.

COURSE, in the constitution of canals, signifies the thickness of puddling, which is done at once, and in the same layer.

COURSE is also used for a collection, or body of laws, canons, or the like. See **CORPUS**.

The *civil course*, is the collection of Roman laws, compiled by order of Justinian. See **CIVIL LAW**.—*Canonical course*, is the collection of the canon law, made by Gratian. See **CANON LAW**.

COURSE, again, is used for the time ordinarily spent in learning the principles of a science, or the usual points and questions therein. Thus, a student is said to have finished his course in the humanities, in philosophy, &c.

COURSE is also used for the elements of an art exhibited and explained, either in writing, or by actual experiment.

Hence, our courses of philosophy, anatomy, chemistry, mathematics, &c. probably so called, as going throughout or running the whole length or course of the art, &c.

COURSE of the moon. See **MOON**.

COURSE, Paddock. See **PADDOCK**.

COURSE, in Horsemanship. See **HIPPODROME and RACE**.

COURSEGOULES, in *Geography*, a small town of France, in the department of Var, chief place of a canton in the district of Grasse. It has but 540 inhabitants, and the population of the canton is 3483, scattered in eight communes, upon a territorial extent of 230 kilometres.

COURSEER. See **CHARGER**.

COURSES, in *Sea-Language*, are the main-sail, fore-sail, mizen and sprit-sail of a ship; which, the mizen excepted, are fixed on their respective yards at right angles with the ship's length; the mizen is bent to a yard or gaff parallel with the ship's length. See **SAILS**.

The *Main-course* is a quadrilateral sail, square on the head, and bending there to the main yard, which hangs to the mast at right angles with the ship's length, and parallel to the deck. This sail extends within 18 inches of the cleats on the yard-arms, and drops to clear the foot from the boat upon the booms. It has two reef-bands, one-third the breadth of a cloth; the upper reef-band is at one-sixth of the depth of the sail from the head, and the lower reef-band is at the same distance from the upper one. It has also a middle-band of one breadth of cloth, half-way between the lower reef-band and the foot, and linings of one breadth of cloth from the clue to the earing on the leeches; and likewise four buntline-cloths at equal distances asunder extending

from the foot to the middle band. In the merchant-service, a middle band is seldom used, and the buntline-cloths run up one quarter of the depth of the sail. Two reef-criingles are made on each leech, one at each reef-band; three bow-line cringles are made at equal distances between the lower-reef cringle and the clue; and buntline cringles are made on the foot, one at the end of each buntline cloth. In sewing on the bolt-rope, two inches slack are taken up in every cloth, in the head and foot, and $1\frac{1}{2}$ inch in every yard in the leeches. The marling-holes extend from the clue to the lower bowline cringle on the leech, and to the first buntline cringle at the foot: the clue is wormed with $\frac{3}{4}$ inch net-line, parcelled with old canvas, well tarred, and served with spun-yarn; it is then marled to the sail with marline or house-line, and seized with several turns of inch-line, strained tight with three cross-turns. To find the quantity of canvas in this sail, add the number of cloths in the head and foot, and halve the product to make it square; then multiply by the depth, and add the quantity in the gores, linings, bands, and pieces. To find the quantity in the foot-gores, add together the number of inches gored in each cloth on one side of the sail, and multiply the product by the number of gored cloths.

The *fore-course* is a quadrilateral sail, square on the head, and bent, at the head, to the fore-yard, which hangs to the fore-mast at right angles with the ship's length, and parallel to the deck. This sail extends within 18 inches of the cleats on the yard-arms, and drops to the main-stay at the foot. Two reef-bands, one-third the breadth of a cloth, are put on at one-sixth of the depth of the sail apart, the upper one being at that distance from the head; a middle-band of one breadth of cloth, is put on half-way between the lower reef-band and the foot; the linings on the leeches are of one breadth of cloth, and extend from the clue to the earing; and four buntline-cloths, at equal distances asunder, on the foot, are carried up to the middle-band. In the merchant-service, middle-bands are seldom used, and the buntline cloths run up one-quarter of the depth of the sail. Marling-holes are made in the tabling from the clue to the nearest buntline-cringle on the foot, and one-eighth of the depth of the sail up the leech. They are turned on the contrary side to the roping, in fixing the sail. Two reef-criingles are made on the leeches, one at the end of each reef-band; as also are two bowline-criingles, the upper bowline cringle is made in the middle of the leech, and the lower one equally distant from the upper one and the clue; a buntline cringle is also made at the end of each buntline-cloth on the foot. The ends of the buntline-criingles, next the clues, should be left long enough to be worked under the service and meet the ends of the clue-rope. In sewing on the bolt-rope, two inches of slack-cloth should be taken up in every cloth, in the head and foot, and $1\frac{1}{2}$ inch in every yard in the leeches. The clue is wormed with spun-yarn, parcelled with slips of tarred canvas; served with 3 or 4 yarn spun-yarn, marled on with marline or house-line, and seized with several turns of inch line, strained tight with three cross-turns.

To find the quantity of canvas in this sail, add the number of cloths in the head and foot, halve the product to make it square, then multiply by the depth, and add the quantity in the gores, linings, bands, and pieces. To find the quantity in the foot-gores, add together the number of inches gored in each cloth on one side of the sail, and multiply the product by the number of gored cloths.

The *mizen-course* is a quadrilateral sail, the head of which is bent to the mizen-yard or gaff, and extends within 9 inches of the cleats. The fore-leech is attached to the mizen-mast within 6 or 7 feet of the deck, so that it hangs fore and aft in the plane of the ship's keel. The head is cut with a gore

of 16 to 22 inches per cloth, agreeable to the peek; the foot is gored one inch per cloth, leaving two cloths square in the middle. One cloth on the malt-leech is sometimes gored in the navy, and sometimes two cloths in the merchant service. This sail has a reef-band, 6 or 8 inches broad, at one-fifth of the depth of the malt-leech from the foot. The after leech is lined from the clue with one breadth of cloth 5 yards long, and the rock and peek with pieces so cut from each other that each contains one yard. One cringle is made on each leech at the ends of the reef-band, and one at the distance of every three-quarters of a yard on the malt-leech; or sometimes holes are worked in the tabling of the malt leech; a cringle is also made 5 yards from the clue on the after-leech for the throat-brails. Two inches of slack-cloth in every yard should be taken up in sewing the bolt-rope on the malt-leech, but none in the foot or after-leech. The marling-holes extend 2 feet each way from the clue; the clue is seized with three-quarter-line, and is left 9 inches long from the seizing. To find the quantity of canvas in this sail, add the depth of the fore and after-leech, and halve the product for a mean depth; multiply this by the number of cloths, and add the quantity of canvas in the foot-gores, pieces, and reef-band. To find the quantity in the foot-gores, multiply the number of cloths by the depth by which the square cloths in the middle exceed those at the tack; from the product subtract the gores from the square cloths to the tack and clue.

The *sprit-sail course* is quadrilateral, square on the head, foot, and leeches; it is bent at the head to the sprit-sail yard, and hangs under the bowsprit at right angles with the ship's length, extending within 9 inches of the cleats in the yard-arms. Two reef-bands, one-third of the breadth of a cloth, are put on diagonally; the ends on the leeches being 27 inches from the clues, and those at the head on the first or second seam from the earings. Sometimes a reef-band is put on from leech to leech, at one-fifth of the depth of the sail from the head. A water-hole, from 4 to 6 inches diameter, is made in the second cloth from each leech, near the foot or opposite the reef-criingles. The marling-holes extend two feet each way from the clues. A reef-criingle is made in the leeches at the end of each reef-band, and two buntline-criingles are made in the foot-rope, at one-third of the breadth of the foot from each clue. To find the quantity of canvas in this sail, multiply the number of cloths by the depth, and add the quantity in the reef-bands.

A ship is said to sail under a *pair of courses*, when she sails under a main-sail and fore-sail only, without lining or any bonnets.

COURSING, an amusement of great antiquity, treated on by Arrian, who flourished A. D. 150. It was first used by the Gauls; the most luxurious and opulent of whom used to send out good hare-finders early in the morning, to those places where it was likely to find hares fitting; they returned to their employers with an account of the number of hares found, who then mounted their horses and took out their greyhounds to course them; not more than two greyhounds were to be ran at once, and these were not to be laid in too close to the hare; for although that animal is swift, yet when first started, she is so terrified by the hallooing, and by the closeness and speed of the dogs, that in the confusion of fear, the best sporting hares were frequently killed without shewing any diversion; she was therefore allowed to run some distance from her "feat," before the dogs were set after her. The best hares were those found in open and exposed places; they did not immediately try to avoid the danger by running into the woods; but whilst contending in swiftness with the greyhounds, moderated their own

speed according as they were pressed; if overmatched in speed by the dogs, they then tried to gain ground by frequent turns, which threw the dogs beyond them, making at the same time their shortest way to the covers, or nearest shelter. The *true sportsman* did not, even in Arrian's time, take out his dogs to destroy the hares, but for the sake of seeing the contest between them, and was glad if the hare escaped, which was never prevented, by disturbing any brake in which she might have concealed herself; after beating the greyhounds, they were also frequently taken alive from the dogs, by the huntsmen who closely followed them; and after the greyhounds were taken up, were turned out for future sport. They used to speak to their greyhounds while in the field, considering it a kind of encouragement to them to know that their master was a witness of the excellence of their running; but this *speaking* was recommended to be chiefly confined to the *first course*, left, after being weakened by a second or third, they might, by such encouragement, exert themselves beyond their strength, and hurt their *insides*, which was thought to be the destruction of many good dogs. Those who had not the convenience of hare-finders, went out commonly in a company on horseback; when they beat the likely grounds, and on starting a hare, the greyhounds were let loose after her:—those who were more keen after the sport used to go on foot, and if any one accompanied them on horseback, it was his business to follow the dogs during the course. It is singular, that after the lapse of so many centuries, the mode of *beating* for a hare, in coursing, should be *now* exactly what it then was. The company were drawn up in a straight rank, either horse or footmen, and proceeded at certain distances from each other, in a direct line to a given point, and whirling round, that they might not go over precisely the same track, they beat the ground regularly back. This practice is still continued. A person was appointed to take the command of the sport; if there were many dogs out, he gave orders that such and such dogs should be slipped, according as the hare took to the right or the left, and these orders were punctually obeyed.

The Gauls sometimes mixed and used *finders* with their greyhounds, and while these tried to find the hare, the greyhounds were led by the hand at a small distance, taking care, however, to lead them where the hare was most likely to come; and here the greyhounds pretty well supplied the use of "Xenophon's nets." This method of *coursing* was deemed irregular, as the stoutest hares were so alarmed with the cries of the finders, that if they did not start a considerable way before, they were sure to be killed. This method is very much practised in some parts of Great Britain, to the great consolation of those, who think no course worth having, unless there is a hare at the end of it. A *young* hare, when found sitting, was not disturbed, as it was considered unfair to run the greyhounds at her; but with the finders, (who are said to have been very eager through hunger, and so desirous of eating up what they caught, that it was difficult to get them off, even by beating them with sticks,) the exercise of this clemency was impossible.

In ancient times, three several animals were coursed with greyhounds, *viz.* the deer, the fox, and the hare. The two former are not practised at present; but the coursing of deer was formerly a recreation in high esteem, and was divided into two sorts: the *Paddock*, and the *Forest* or *Purlieu*. For the paddock-coursing, besides the greyhounds, which never exceeded two, and for the most part consisted of one brace, there was the teaser or mongrel greyhound, whose business it was to drive the deer forward before the real greyhounds were slipped. As soon as the greyhounds that were

to run the match were led into the dog-house, situated at the end of the *Paddock* (which see), they were delivered to the keepers, who, by the articles of coursing, were to see them fairly slipped; for which purpose, there was round each dog's neck a "falling collar," which slipped through rings. The owners of the dogs drew lots which dog should have the bell, that there might be no advantage. The dog-house door was then shut, and the keeper turned out the deer: after the deer had gone about 20 yards, the person who held the teaser loofed him, to force the deer forward; and when the deer was got to the "Law-post," or to the distance of about 160 yards, the dogs were led out from the dog-house, and slipped. If the deer swerved before he got to the "Pinching-post," so that his head was judged to be nearer the dog-house than the ditch, or place made for receiving the deer, so that they might not further be pursued by the dogs, it was deemed no match, and was to be run again three days after; but if there was no such swerve, and the deer ran straight till he went beyond the pinching-post, then that dog which was nearest the deer (should he swerve,) gained the contest; if no swerve happened, then that dog which leaped the ditch first was the victor:—if any disputes arose, they were referred to the articles of the course, and determined by the judges, who sat on seats near the ditch.

In coursing deer in the *Forest* or *Purlieu*, two modes were practised: the one coursing from wood to wood, and the other upon the lawns by the keepers' lodges. In the first, some hounds were thrown into the cover to drive out the deer, whilst the greyhounds were held ready to be slipped where the deer was expected to break: if the deer was not of a proper age and size, the dogs were not let loose; and if, on the other hand, he broke at too great distance, or was otherwise deemed an over-match for one brace, it was allowable to *waylay* him with another brace of fresh greyhounds. For the coursing upon the *Lawn*, the keeper had notice given him, and he took care to lodge a deer fit for the purpose; and by sinking the wind of him, there was no danger of getting near enough to slip the greyhounds, and having a fair course.

In coursing the *fox*, no other art was necessary but to get the wind, and stand close on the outside of the wood, where he was expected to come out, and to give him law enough, or be instantly returned back to the cover. The slowest greyhounds were speedy enough to overtake him; and the whole hazard was, that of the fox spoiling the dog, which frequently happened: for the most part, the greyhounds used for this course were hard-bitten dogs, that would seize any thing.

The best method of coursing the *hare* was formerly to go out and find a hare sitting, which is easily done in the summer, by walking across the lands, either stubble, fallow, or corn grounds, and casting the eye up and down; for in summer they frequent these places for fear of the ticks, which are common in the woods at that season; and in autumn, the rains falling from the trees offend them. The rest of the year there requires more trouble, as the bushes and thickets must be beat to rouse them, and often they will lie so close, that they will not stir till the pole almost touches them: the sportsmen are always pleased with this, as it promises a good course.

If a hare sat near a close or cover, with an open field behind her, the company stationed themselves so as to force her to the champaign; for it is remarked, that a hare seldom takes the same way which her head points when in her form. The *feuterer*, or person that lets loose the greyhounds, was to receive those that were matched to run together into his *Leash*, as he came into the field, and to fol-

low next to the hare-finder, or him that was to start the hare, until he came to the form; and no horse or footmen were to go before, or on either side, but directly behind, for the space of about 40 yards. A hare was not to be coursed with more than a brace of greyhounds. The hare-finder was to give the hare three "Soho's," before he put her from her form, to give notice to the dogs that they might attend her starting. The hare was to have twelve-score yards law before the dogs were loofed, unless the small distance from cover would not admit it, without danger of immediately losing her. Without this law the hare would be killed too soon, and the greatest part of the sport thrown away, and the pleasure of the several windings and turnings that the creature will make to get away, would be wholly lost. A good sportsman had rather see a hare save herself, after a fair course, than see her murdered by the greyhounds as soon as she is up.

The laws of coursing were established by the duke of Norfolk, in the reign of queen Elizabeth, and were agreed to by the nobility and gentry, who then followed the diversion; and they have been always held authentic. For particulars we refer to "Daniel's Rural Sports," vol. i. The person who came in first at the death took up the hare, saved her from being torn, cherished the dogs, and cleaned their mouths from the wool, was adjudged to have the hare for his trouble. Those that were judges of the course were to decide before they departed out of the field.

Coursing, Mr. Daniel observes, has apparently lost nothing of its value in the eye of the sportsman, however it may have suffered in the splendour which accompanied it when honoured with the royal presence in former ages. It is an amusement much in vogue at the present period; and Mr. Daniel has given an account of the meetings held for the express purpose of enjoying this diversion. Among the first, with regard to time and numbers, was the society established in 1776, at Swaffham in Norfolk, by the late earl of Orford. The rules of the Wiltshire coursing, so far as relate to the greyhounds in the field, are, that the dog that has the most of the course is the winner, whether he is the dog that kills the hare or not; and that if a dog stops in any part of the course, and does not run *home*, it is always decided against him. The dogs are now loofed from slips of a better construction than those formerly in use, so that it is impossible for either dog to have the least advantage given him at starting. It is observed by the writer just cited, that for coursing, hares on marshes or downs are the stoutest. The open country about Swaffham in Norfolk, and the Downs in Wiltshire, are both noted; but above all, the Flixton Wolds, in Yorkshire. The Flixton hares are so stout, that the course is extended sometimes to the length of five or six miles: they are generally found on the side of a hill to the north, which they invariably ascend; at the top they have flat down for three or four miles, and then a steep descent, after which they ascend a hill almost perpendicular; at the top is a large whin-cover, into which these beat many capital greyhounds; and perhaps it is the only place in England where a hare was ever seen to beat for four miles over turf a brace of the best greyhounds that could be produced.

Hares are said to foresee a change of weather, and to seat themselves accordingly: they are seldom found in places much exposed to the winds, especially when it is southerly or northerly; and they who get money by finding hares, are directed by the wind where to look for their game. Near the hedges or inclosures they are more frequently found than in the middle of the field. Shepherds and hare-finders remark, that hares on the Downs have variety of seats, which,

as the weather directs, they change from time to time, and return to again; and that the more rain that falls, the nearer to the top of the hills the hare seats herself. When sitting, she covers the lower parts of her joints with her belly, her fore-legs are most commonly extended forward, and her chin rests on the extremity of her feet. When a hare is seen sitting, the sex may be known: if a buck, the ears will be close together; those of the doe will be distended on each side of the neck and shoulders. The approach must be cautious, not directly towards a hare on her form, or else she will instantly start from it. For other particulars relating to the rabbit, see GREYHOUND and HARE.

COURSILLER, Fr. is a gun that is placed in the fore-catch of a galley for the purpose of firing over its beak. The weight of its ball is from 33 to 34 lb. The gun, however, may be of any size, and the ball, of course, of any weight.

COURSON, in *Geography*, a small town of France, in the department of the Lower Charente, and chief place of a canton, in the district of La Rochelle; 15 miles E. of that port. It counts 803, and the canton itself 7254 inhabitants. The latter has eleven communes, and a territorial extent of 257 kilometres and a half.—Also, a village in the department of Yonne, which formerly was a county; 12 miles S.W. of Auxerre.

COURT DE GEBELIN, N., in *Biography*, was born at Nîmes in 1725: for some time he was a preacher at Lausanne in Switzerland; not contented, however, with his situation, he removed to Paris, where, at different periods, he published, in eight volumes, a work, entitled, “The primitive World analyzed and compared with the modern World;” which exhibited much ingenuity and research, but which did not prove so profitable to the author as he had anticipated. He was accordingly remunerated, on account of his integrity and worth, by the French academy; and he was appointed a superintendent to one of the museums at Paris. In the latter part of his life he became the advocate of animal magnetism, a subject, by which an infatuated public was for some time led away: to his zeal in this cause, he is said to have fallen a victim in the year 1784. After his decease, the ninth volume of his “Primitive World” was published. Court was author of the “Natural History of Language,” or, “A Summary of Universal Grammar.”

COURT, an appendage to a house or habitation; consisting of a piece of ground inclosed with walls, but open upwards.

The word is formed from the French *cour*, and that from the Latin *cobors*: whence also *cortis* and *curtis* are sometimes used for the same. In the laws of the Germans, there is one article, *De eo qui in curte regis furtum commiserit*; and another, *De eo qui in curte ducis hominem occiderit*. Others derive *court* from the Gaulish *cors*, formed of *cobors*, and *cobors* from $\chi\alpha\tau\omega$. See COHORT.

The court before a house is properly called the *fore-court*; that behind, the *back-court*; that where country affairs, &c. are managed, *i. e.* where cattle, &c. come, the *laffe-court*.

COURT is also used for the palace, or place where a king or sovereign prince resides.

COURT, *Curia*, in a *Law Sense*, is the place where justice is judicially administered. (Co. Litt. 58.) It denotes also the assembly of judges, jury, &c. in that place.

By the law of England, no court in this kingdom can claim any jurisdiction, unless it be some way or other derived from the crown; the king being the fountain of justice, and the supreme magistrate of the kingdom, intrusted with the whole executive power of the land.

To him alone, therefore, belongs the right of erecting

courts of judicature; for though the constitution of the kingdom hath entrusted him with the whole executive power of the laws, it is impossible, as well as improper, that he should personally carry into execution this great and extensive trust. It is, consequently, necessary, that courts should be erected, to assist him in executing this power; and equally necessary, that, if erected, they should be erected by his authority. And hence it is, that all jurisdictions of courts are either mediately or immediately derived from the crown, their proceedings are generally in the king's name, they pass under his seal, and are executed by his officers, whether created by act of parliament, or letters patent, or subsisting by prescription, (the only methods by which any court of judicature can exist,) the king's consent in the two former is expressly, and in the latter impliedly, given. (Co. Litt. 260.) In all these courts, the king is supposed, in contemplation of law, to be always present; but as this is in fact impossible, he is represented by his judges, whose power is only an emanation of the royal prerogative. See JUDGE.

Yet the king cannot give any addition of jurisdiction to an ancient court; but all such courts must be held in such manner, and proceed by such rules, as their known usage has limited and prescribed. Whence it follows, for instance, that the court of king's bench cannot be authorized to determine a mere real action between subject and subject; nor can the court of common pleas enquire of treason or felony. Accordingly, the king hath committed all his power judicial to one court or the other. (4 Inst. 71.) And by stat. 52 Hen. III. c. 1, it is enacted, that all persons shall receive justice in the king's courts, and none take any distress, &c. of his own authority, without award of the king's courts. Moreover, it is said, that the customs, precedents, and common judicial proceedings of a court are a law to that court; and the determinations of courts make points to be law. (2 Rep. 12. 4 Rep. 53. Hob. 298.) All things determinable in courts, that are courts by the common law, shall be determined by the judges of the same courts; and the king's writ cannot alter the jurisdiction of a court. (6 Rep. 11.) The court of B. R. regulates all the inferior courts of law in the kingdom, so that they do not exceed their jurisdictions, nor alter their forms, &c. And as the court of king's bench has a general superintendency over all inferior courts, it may award an attachment against any such court, usurping a jurisdiction not belonging to it; but it is sometimes usual first to award a writ of prohibition, and afterwards an attachment, upon its continuing to proceed. (2 Hawk. P. C. c. 22. § 25.) If a court, having no jurisdiction of a cause depending in it, does nevertheless proceed, the judgment in such court is *coram non iudice*, and void; and an action lies against the judges who give the judgment, and any officer that executes the process under them. (1 Lil. Abr. 370.)

Of the variety of courts, appointed for the more speedy, universal, and impartial administration of justice, and possessing either a more limited or a more extensive jurisdiction, (of which Crompton describes 32 in England,) some are *superior*, and others *inferior*. To all of them, however, one distinction belongs; *viz.* that some of them are courts of *record*, and others *not of record*. A court of record is that where the acts and judicial proceedings are enrolled in parchment for a perpetual memorial and testimony: which rolls are called the records of the court, and are of such high and super-eminent authority, that their truth is not to be called in question. See RECORD.

All courts of record are the king's courts, in right of his crown and royal dignity (Finch. L. 231.), and, therefore,

no other court hath a right to fine or imprison; so that the very erection of a new jurisdiction, with power of fine or imprisonment, makes it instantly a court of record. (Salk. 200. 12 Mod. 383.) These courts have power to hold plea, according to the course of the common law, of real, personal, and mixed actions, where the debt or damage is above 40s.; as the king's bench, common pleas, &c. A court not of record is the court of a private man; whom the law will not intrust with any discretionary power over the fortune or liberty of his fellow subjects. Such are the courts-baron incident to every manor, and other inferior jurisdictions, where the proceedings are not enrolled or recorded; but as well their existence as the truth of the matters therein contained shall, if disputed, be tried and determined by a jury. A writ of false judgment, and not of error, lies on their judgments. These courts can hold no plea of matters cognizable by the common law, unless under the value of 40s., nor of any forcible injury whatsoever, not having any process to arrest the person of the defendant. (2 Inlt. 311.)

Courts, both of civil and criminal jurisdiction, are distributed into two classes; viz. those which have public and general jurisdiction throughout the whole realm, and such as are only of a private and special jurisdiction, in some particular parts of it. To the class of *civil* courts of the former kind belong the following four sorts; 1. The universally established courts of common law and equity, as the court of pie-poudre, court-baron, hundred-court, county-court, court of common-pleas, court of king's bench, court of exchequer, high court of chancery, court of exchequer-chamber, the house of peers, or supreme court of judicature in the kingdom, and the courts of assise and nisi prius.—2. The ecclesiastical courts, or courts christian, such are the arch-deacon's court, the consistory court of every diocesan bishop, the court of arches, the court of peculiars, the prerogative court, the court of delegates, and commission of review.—3. The courts military, as the court of chivalry:—4. The maritime courts. To the class of courts having a special jurisdiction belong the forest courts, the court of commissioners of sewers, the court of policies of assurance, the court of the marshalea, and the palace court at Westminster, the courts of the principality of Wales, the court of the duchy chamber of Lancaster, the courts appertaining to the counties palatine of Chester, Lancaster, and Durham, and the royal franchise of Ely, the stannary courts in Devonshire and Cornwall, the several courts within the city of London, and other cities, boroughs, and corporations, throughout the kingdom, the courts of requests, or courts of conscience, and the chancellor's courts in the two universities of England.

Criminal courts of a public and a general jurisdiction are the high court of parliament, which is the supreme court in the kingdom, the court of the lord high steward of Great Britain, the court of king's bench, the court of chivalry, the high court of admiralty, which five courts may be held in any part of the kingdom, and their jurisdiction extends over crimes that arise throughout the whole of it, from one end to the other; of a general nature, and yet of a local jurisdiction, confined to particular districts; the courts of oyer and terminer, and general gaol-delivery, the court of general quarter-sessions of the peace, the sheriff's tourn, the court-leet, the court of the coroners, and the court of the clerk of the market; to which we may add the courts of greater dignity than many of those already enumerated, but of a more confined and partial jurisdiction, such as the court of the lord steward, treasurer, or comptroller of the king's household, the court

of the lord steward of the king's household, &c., and courts of the universities. We shall now proceed to describe each of these in alphabetical order.

COURT of Admiralty, is a court held by the high admiral, or commissioners of the admiralty; to which belongs the decision of all maritime controversies, trials of malefactors, and the like.

The proceedings in this court, in all civil matters, are according to the civil law; because the sea is without the limits of the common law, and under the admiral's jurisdiction. As this court proceeds according to the method of civil law, like the ecclesiastical courts, it is usually held at the same place with the superior ecclesiastical courts, at Doctors' Commons in London.

In criminal affairs, which ordinarily relate to piracy, robbery, and murder, the proceedings in this court were anciently likewise by information and accusation, according to the civil law; but that being found inconvenient, because no person could be convicted without either their own confession, or two witnesses of the fact, so that the greatest offenders often escaped with impunity, it was enacted by statute 28 Henry VIII. c. 15. that offenders amenable to this court should be tried by commissioners of oyer and terminer, under the king's great seal; namely, the admiral, or his deputy, and three or four more; (among whom two common law judges are usually appointed;) the indictment being first found by a grand jury of twelve men, and afterwards tried by a petty jury; and that the course of proceedings should be according to the law of the land. This is now the only method of trying marine felonies in the court of admiralty: the judge of the admiralty still presiding therein, as the lord mayor is the president of the session of oyer and terminer in London. This court hath cognizance of all crimes and offences committed either upon the sea, or on the coasts, out of the body or extent of any English county; and, by stat. 15 Ric. II. c. 3, of death and mayhem happening in great ships being and hovering in the main stream of great rivers, below the bridges of the same rivers, which are then a sort of ports or havens; such as are the ports of London and Gloucester, though they lie at a great distance from the sea. 5 Eliz. c. 5. 1 Ann. c. 9. 4 Geo. I. c. 11.

The court of admiralty is said to have been first erected in 1357, by king Edward III. To the civil law, first introduced in it by the founder, were afterwards added, by his successors, particularly Richard I., the laws of Oleron, and the marine uses and constitutions of several people; as those of Genoa, Pisa, Marfeilles, Messina, &c. The jurisdiction of this court was limited by Richard II. 13 Ric. II. it. 1. c. 5. 15 Ric. II. c. 3.

Under this court is also a court-merchant, or court of equity; wherein all differences between merchants are decided according to the rules of the civil law.

Between the courts of admiralty and common law, there seems to be *divisum imperium*; for the sea, so far as the low-water mark, is accounted *infra corpus comitatus adjacentis*; and the causes thence arising are determinable by the common law; yet, when the sea is full, the admiral has jurisdiction there also so long as the sea flows, over matters done between the low-water mark and the shore.

The admiralty court is not allowed to be a court of record, because it proceeds by the civil law; and the judge has no power to take such a recognizance as a court of record may. The process and proceedings are in the name of the lord admiral, and by libel; and the plaintiff and defendant enter into a stipulation or bond for appearance, and to abide the sentence. 4 Inlt. 134, 135.

If an erroneous judgment be given in the admiralty, appeal

peal may be had to delegates appointed by commission out of chancery, whose sentence shall be final. Stat. 8 Eliz. c. 5.

Appeals from the vice-admiralty courts in America, and our other plantations and settlements, may be brought before the courts of admiralty in England, as being a branch of the admiral's jurisdiction; though they may be also brought before the king in council. But in case of prize-vessels, taken in time of war, in any part of the world, and condemned in any courts of admiralty, or vice-admiralty, as lawful prize, the appeal lies to certain commissioners of appeals, consisting chiefly of the privy-council, and not to judges delegates. This is by virtue of divers treaties with foreign nations; by which particular courts are established in all the maritime countries of Europe, for the decision of the question, whether lawful prize or not; for this being a question between subjects of different states, it belongs entirely to the law of nations, and not to the municipal laws of either country, to determine it: the original court to which this question is referred in England is the court of admiralty; and the court of appeal is in effect the king's privy-council; the members of which are, in consequence of treaties, commissioned under the great seal for this purpose.

In Scotland the jurisdiction of the admiral in maritime causes was formerly concurrent with that of the session. The high admiral is declared the king's justice-general upon the seas, or fresh water within flood-mark, and in all harbours and creeks. His civil jurisdiction extends to all maritime causes, and thus comprehends questions of charter-parties, freights, salvages, bottomries, &c. He exercises this supreme jurisdiction by a delegate, the judge of the high court of admiralty; and he may also name inferior deputies, whose jurisdiction is limited to particular districts, and whose sentences are subject to the review of the high court. In causes which are declared to fall under the admiral's cognizance, his jurisdiction is sole; inasmuch, that the session itself, though it may review his decrees of suspension or reduction, cannot carry a maritime question from him by advocacy. The admiral has acquired, by usage, a jurisdiction in mercantile causes, even where they are not chiefly maritime, cumulative with that of the judge-ordinary.

Among the Hollanders, the five *admiralties* were, according to their old constitution, so many chambers, composed of the deputies of the nobles, the provinces, and the towns; to whom belong the equipping out of fleets, the furnishing provisions for them, and directing what relates to maritime affairs.

COURT of Aids, in France. See AID.

COURT of Archdeacon, is the most inferior court in the whole ecclesiastical polity. It is held in the archdeacon's absence before a judge, appointed by himself, and called his official; and its jurisdiction is sometimes in concurrence with, sometimes in exclusion of, the bishop's court of the diocese. From hence, however, by statute 24 Hen. VIII. c. 12, an appeal lies to that of the bishop.

COURT of Arches, *Curia de Arcubus*, the chief and most ancient consistory court belonging to the archbishop of Canterbury, for the debating of spiritual causes. It is so called from the church in London, commonly called St. Mary le Bow (Sancta Maria de Arcubus), where it was formerly held; which church had its name from the steeple, which was raised by pillars built archwise, like bent bows. Cowel.

The judge of this court is styled *dean of the arches*, or official of the *arches court*. He hath extraordinary jurisdiction in all ecclesiastical causes, except what belong to the prerogative court; also all manner of appeals from bishops, or their chancellors or commissaries, deans and chapters, &c. first or last are directed hither. He hath ordinary jurisdiction throughout the whole province of Canterbury in cases of appeals; so that upon any appeal made, he, without any farther examination of the cause, sends out his citation to the appellee, and his inhibition to the judge, from whom the appeal was made. Of this see more, 4 Inst. 337. But he cannot cite any person out of the diocese of another, unless it be on appeal, &c. 23 Hen. VIII. c. 9. In another sense, the dean of arches has a peculiar jurisdiction of thirteen parishes in London, belonging to the archbishop, called a deanery (being exempt from the authority of the bishop of London), of which the parish of Bow is the principal. The persons concerned in this court, are the judge, advocate, registers, proctors, &c. and the foundation of a suit in these courts, is a citation for the defendant to appear; then the libel is exhibited, which contains the action, to which the defendant must answer: whereupon the suit is contested, proofs are produced, and the cause determined by the judge, upon hearing the advocates on the law and fact; when following the sentence and decree thereupon. See AUDIENCE.

This court (as also the court of peculiars, the admiralty court, the prerogative court, and the court of delegates, for the most part) is now held in the hall belonging to the college of civilians, commonly called Doctors Commons.

From this court, the appeal is to the king in Chancery, (that is, to a court of delegates appointed under the king's great seal.) by 25 Hen. VIII. c. 19. as supreme head of the English church, in the place of the bishop of Rome, who formerly exercised this jurisdiction.

COURT of Assise. See ASSISES.

COURT of Augmentation, the name of a court erected, 27 Hen. VIII. for determining suits and controversies, relating to monasteries and abbey lands. The intent of this court was that the king might be justly dealt with, touching the profit of such religious houses, and their lands, as were given him by act of parliament the same year. This court was dissolved under queen Mary, by the parliament held the first year of her reign; but the office of *augmentation* remains to this day, in which are many valuable records. Terms de Ley. 68.

COURT of Barghmote. See BARGHMOTE.

COURTS Baron, are courts which all lords of manors, who were anciently called *barons*, have within their respective precincts. Such a court is an inseparable incident to a manor; and must be held by prescription, for it cannot be created at this day. 1 Inst. 58. 4 Inst. 268.

A *court baron* must be kept by the steward on some part of the manor; and is twofold. 1. *By custom*: as, if a man having a manor in a town, grant the inheritance of the copyholds thereto belonging to another; this grantee may keep a court for the customary tenants, and accept surrenders to the use of others, and make both admittances and grants. (See COPYHOLD.) 2. *By common law*. This is of freeholders, which is properly called a *court baron*, wherein the freeholders are judges, and the steward is rather the registrar than the judge; whereas of the other, the lord or his steward is judge.

These two courts, though essentially distinct, are frequently confounded. The latter, or freeholders' court, was composed of the lord's tenants, who were the *peers* of each other, and were bound by their feudal tenure to assist their lord in the dispensation of domestic justice. This was formerly held every three weeks; and its most important business is to determine, by writ of right, all controversies relating to the right of lands within the manor. It may also hold

hold plea of any personal actions, of debt, trespass on the case, or the like, where the debt or damages do not amount to 40s. (Finch. 248.) But the proceedings on a writ of right may be removed into the county-court by a precept from the sheriff, called a "tolt," *quia tollit atque eximit causam e curia baronum*. And the proceedings in all other actions may be removed into the superior courts by the king's writs of "pone," or "accedas ad curiam," according to the nature of the suit. (F. N. B. 4. 70. Finch. L. 444, 445.) After judgment given, a writ also of "false judgment" lies to the courts at Westminster to rehear and review the cause, and not a writ of "error;" for this is not a court of record; and therefore, in some of these writs of removal, the first direction given is to cause the plaintiff to be recorded, "recordari facias loquelam."

COURT, *Bishop's*, or *Consistory Court*, an ecclesiastical court held in the cathedral of each diocese, for the trial of all ecclesiastical causes arising within their respective dioceses; the judge whereof is the bishop's chancellor, or his commissary, anciently called *ecclesiasticus*, and *ecclesie causidicus*, q. d. the church-lawyer; who judges by the civil and canon law; and, if the diocese be large, has his commissaries in remote parts, who hold what they call *consistory courts*, for matters limited to them by their commission. From the sentence of this judge, appeal lies, by virtue of the statute 24 Hen. VIII. c. 12. to the archbishop of each province respectively.

COURT of *Chancery*, the grand court of equity, and conscience, instituted to moderate the rigour of the other courts that are tied to the strictest letter of the law; and in matters of civil property the most important of any of the king's superior and original courts of justice.

The judge of this court is the lord high chancellor, whose function see under CHANCELLOR.

The proceedings of this court are either *ordinary*, like other courts, according to the laws, statutes, and customs of the nation, by granting out writs remedial and mandatory, writs of grace, &c. or *extraordinary*, according to equity and conscience, by bills, answers, and decrees, to examine frauds, combinations, trusts, secret uses, &c. to soften the severity of common law, and rescue people from oppression; to relieve them against cheats, unfortunate accidents, breaches of trust, &c.

The ordinary legal court is much more ancient than the court of equity. Its jurisdiction is to hold plea upon a *scire facias* to repeal and cancel the king's letters patent, when made against law, or upon untrue suggestions; and to hold pleas of petitions, *monstrans de droit*, traverses of offices, and the like; when the king hath been advised to do any act, or is put in possession of any lands or goods, in prejudice of a subject's right. (4 Rep. 54.) On proof of which, as the king can never be supposed intentionally to do any wrong, the law questions not but he will immediately redress the injury; and refers that conscientious task to the chancellor, the keeper of his conscience. It also appertains to this court, to hold plea of all personal actions, where any officer or minister of the court is a party. (4 Inst. 80.) It might likewise hold plea (by *scire facias*) of partitions of lands in coparcenary, (Co. Litt. 171. F. N. B. 62.), and of dower (Bro. Abr. tit. Dower, 66. Morr. 565.), where any ward of the crown was concerned in interest, so long as the military tenures subsisted; as it now may also do of the tithes of forest land, where granted by the king, and claimed by a stranger against the grantee of the crown; and of executions on statutes, or recognizances in nature thereof by the statute 23 Hen. VIII. c. 6. (2 Roll. Abr. 469.) But if any cause come to issue in this court,

that is, if any fact be disputed between the parties, the chancellor cannot try it, having no power to summon a jury; but must deliver the record *PROPRIA MANU* into the court of king's bench, where it shall be tried by the country, and judgment shall be given thereon. (Cro. Jac. 12. Latch. 112.) And when judgment is given in chancery, upon demurrer, or the like, a writ of error, in nature of an appeal, lies out of this ordinary court into the court of king's bench. In this ordinary, or legal, court, is also kept the *officina justitie*; out of which, all original writs that pass under the great seal, all commissions of charitable uses, sewers, bankruptcy, idiocy, lunacy, and the like, do issue; and for which it is always open to the subject, who may there, at any time, demand and have, *ex debito justitie*, any writ which his occasions may call for. Sometimes a *super-sedeas*, or writ of privilege, hath been granted here to discharge a person out of prison. An habeas corpus, prohibition, &c. may be had from hence in the vacation; and here a subpoena may be had to force witnesses to appear in other courts, when they have no power to call them. (4 Inst. 79. 1 Danv. Abr. 776.)

The extraordinary court, or court of equity, is now become the court of the greatest judicial consequence. This distinction between law and equity, as administered in different courts, is not at present known, nor seems to have been ever known in any other country at any time; and yet the difference of one from the other, when administered by the same tribunal, was perfectly familiar to the Romans; the *jas pretorium*, or discretion of the prætor, being distinct from the *leges*, or standing laws, but the power of both centered in the same magistrate, who was equally entrusted to pronounce the rule of law, and to apply it to particular cases by the principles of equity. With us also, the *aula regia*, which was the supreme court of judicature, undoubtedly administered equal justice, according to the rules of both or either, as the case might chance to require; and when that was broken to pieces, the idea of a court of equity, as distinguished from a court of law, did not subsist in the original plan of partition. For though equity is mentioned by Bracton as a thing contrasted to strict law, yet neither in that writer, nor in Glanvil, or Fleta, nor yet in Britton, is a syllable to be found relating to the equitable jurisdiction of the court of chancery. It seems probable, therefore, that when the courts of law, proceeding merely upon the ground of the king's original writs, and confining themselves to these, gave a harsh or imperfect judgment, the application for redress used to be to the king in person, assisted by his privy council; and they referred the matter either to the chancellor and a select committee, or, by degrees, to the chancellor only, who mitigated the severity, or supplied the defects of the judgments pronounced in the courts of law, upon weighing the circumstances of the case. This was the custom not only among our Saxon ancestors, before the institution of the *aula regia*, but also after its dissolution, in the reign of king Edw. I. and perhaps during its continuance in that of Henry II. In these early times, the chief juridical employment of the chancellor must have been in devising new writs, directed to the courts of common law, to give remedy in cases where none was before administered. Accordingly, provision was made to this purpose by stat. Westm. 2. 13 Ed. I. c. 24, which provision, duly applied, might have effectually answered all the purposes of a court of equity; except that of obtaining a discovery by the oath of the defendant. But about the end of the reign of king Edw. III., when uses of land were introduced, the separate jurisdiction of the chancery as a court of equity began to be established. But as the clergy, so early as the reign

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reign of king Stephen, had attempted to bring their ecclesiastical courts into courts of equity, till they were checked by the constitutions of Clarendon, the ecclesiastical chancellors, who then held the seals, were probably remiss in abridging their own newly-acquired jurisdiction. In the time of lord Ellesmere (A. D. 1616), arose that notable dispute between the courts of law and equity, set on foot by sir Edward Coke, then chief justice of the court of king's bench; whether a court of equity could give relief after or against a judgment at the common law. This contest was so warmly carried on, that indictments were preferred against the suitors, the solicitors, the counsel, and even a master in chancery, for having incurred a *premunire*, by questioning, in a court of equity, a judgment in the court of king's bench, obtained by gross fraud and imposition. (Bacon's Works, vol. iv. 611, &c.) This matter, being brought before the king, was by him referred to his learned counsel for their advice and opinion; who reported so strongly in favour of the courts of equity, that his majesty gave judgment on their behalf; but, not contented with the irrefragable reasons and precedents produced by his counsel, (for the chief justice was clearly in the wrong) he chose rather to decide the question, by referring it to the plenitude of his royal prerogative. (1 Chanc. Rep. Append. 26.) Sir Edward Coke submitted to the decision, and thereby made atonement for his error; but it was followed by his removal from office. (See Article COKE.) Lord Bacon, who succeeded lord Ellesmere, reduced the practice of the court into a more regular system; but did not sit long enough to effect any considerable revolution in the science itself; and few of his decrees which have reached us are of any great consequence to posterity. His successors, in the reign of Charles I., made little improvement on his plan; and even after the restoration, the seal was committed to the earl of Clarendon, who had withdrawn from practice as a lawyer near 20 years; and afterwards to the earl of Shaftesbury, who (though by education a lawyer) had never practised at all. Sir Heneage Finch, who succeeded in 1673, and became afterwards earl of Nottingham, was a person of the greatest abilities and most uncorrupted integrity; a thorough master and defender of the laws and constitution of his country; and endowed with a pervading genius that enabled him to discover and to pursue the true spirit of justice, notwithstanding the embarrassments raised by the narrow and technical notions which then prevailed in the courts of law, and the imperfect ideas of redress which had possessed the courts of equity. The reason and necessities of mankind, arising from the great change in property by the extension of trade, and the abolition of military tenures, co-operated in establishing his plan, and enabled him, in the course of nine years, to build a system of jurisprudence and jurisdiction upon wide and rational foundations; which have also been extended and improved by many great men, who have since presided in chancery. And from that time to this, the power and business of the court have increased to an amazing degree.

The ancient rule for the jurisdiction of the extraordinary court of chancery, was confined to frauds, accidents, and trusts; and though at this day, by its power of granting injunctions, it curbs the jurisdiction of other courts, and thereby has swallowed up the greatest part of the business of the common law; yet it is still under some of these notions, that it exercises a jurisdiction in relieving against forfeitures, penalties, where a compensation can be made, in preventing multiplicity of suits, decreeing a specific execution of agreements, assailing defective conveyances, &c. But in no case

will it relieve against an act of parliament, nor directly against a fundamental rule or maxim of the common law, nor retain a suit where the party appears to have a plain and adequate remedy at law. Three things, says lord Coke, are to be adjudged in a court of equity. 1. All covins, frauds, and deceits, for which there is no remedy by the ordinary course of law. 2. Accidents, as when a servant, obligor, or mortgagor, is to pay money on a certain day, and they happen to be robbed in going to pay it. 3. Breaches of trust and confidence. 4. *Inst. 84.* All matters of trust are particularly within the jurisdiction of the court of chancery.

From this court of equity in chancery, as from the other superior courts, an appeal lies to the house of peers. But there are these differences between appeals from equity, and writs of error from a court of law: 1. That the former may be brought upon any interlocutory matter, the latter upon nothing but only a definitive judgment: 2. That on writs of error, the house of lords pronounces the judgment; on appeals, it gives direction to the court below to rectify its own decree. See APPEAL.

The officers of this court, beside the lord chancellor, who is supreme judge, are, the master of the rolls, who, in the chancellor's absence, hears causes, and gives decrees; and twelve masters of chancery, one of whom is the master of the rolls, who are assistants, and sit by turns on the bench.

For the equity part of this court there are six clerks, and their deputies, who have under them a number of others, called the sixty sworn clerks, in the nature of attorneys of the court; two chief examiners, for examining witnesses, who have each five or six clerks apiece; one principal regiller, who has four or five deputies; clerk of the crown, who makes writs, commissions, &c.; warden of the Fleet; serjeant at arms, who bears the mace before the chancellor; and the usher and crier of the court.

To the common law part belong the twenty-four curiators, and their clerks, who make out original writs; clerks of the petty bag; clerks of the hanaper; comptroller of the hanaper; clerk of appeals; clerk of the faculties; sealer; chafewax; clerks of the patents, of presentations, dismissions, licenses to alienate, enrollments, protections, subpœnas, affidavits, &c. See each under its own article. For a further account of the proceedings in the court of chancery, or a court of equity, see EQUITY; and for the mode of conducting a suit in chancery, see SUIT.

COURT of Chivalry, called also *Marshal's Court*, is one of the military courts, formerly held before the lord high constable and earl marshal of England jointly; but since the attainder of Stafford duke of Buckingham, in the 13th of Henry VIII., and the consequent extinguishment of the office of lord high constable, it hath usually, with respect to civil matters, been held before the earl marshal only. This court, by statute 13 Ric. II. c. 2., hath cognizance of contracts and other matters touching deeds of arms and war, as well out of the realm as within it. And from its sentences an appeal lies immediately to the king in person. (4 *Inst.* 125.) This court was in great reputation in the times of pure chivalry, and afterwards during our connections with the continent, by the territories which our princes held in France; but it is now grown almost entirely out of use, on account of the feebleness of its jurisdiction, and want of power to enforce its judgments: as it can neither fine nor imprison, not being a court of record. (7 *Mod.* 127.)

This court, which is a military court, or court of honour, when held before the earl marshal only, is also a criminal court, when held before the lord high constable of England jointly with the earl marshal. Then it has jurisdiction over pleas

pleas of life and member, arising in matters of arms and deeds of war, as well out of the realm as within it. But the criminal, as well as civil, part of its authority, is fallen into entire disuse, since the extinguishment of the office of *High Constable* of England. See also CHIVALRY.

COURT Christian, Curia Christianitatis, is an ecclesiastical judicature, opposed to the *civil court*, or lay tribunal: and as in secular courts, human laws are maintained; so in the court Christian, the laws of Christ should be the rule. The judges therefore are divines; as archbishops, bishops, archdeacons, &c. 2 Inst. 488. Courts Christian are so called, because they handle matters especially appertaining to Christianity. See COURTS Ecclesiastical, infra. See also CONSISTORY.

COURTS of Cinque-ports. See CINQUE-PORTS.

COURT of Clerk of the Market. See CLERK of the Market.

COURT, Circuit, a court in Scotland, which can judge in all criminal causes which do not infer death or demerbration, upon appeal from any inferior court within their district; and has a supreme civil jurisdiction, by way of appeal, in all causes not exceeding 12*l.* sterling, in which their decrees are not subject to review; but no appeal is to lie to the circuit, till the cause be finally determined in the inferior court.

COURT of Common Pleas, Communia placita, or Bancus communis, one of the king's courts, held in Westminster-hall. Gwyn observes, that till the granting of Magna Charta, there were but two courts called the king's courts, *viz.* the exchequer, and the king's bench; and that upon the grant of that charter, the court of common pleas was erected, and fixed to a place certain, *viz.* Westminster-hall: whence the writs which before ran *coram me vel justiciariis meis*, simply, were now changed, and run *coram justiciariis meis apud Westmon.* See AT LA Regia.

Sir Edward Coke, however, is of opinion (Pref. to 3th Report, and 1 Inst. 71*b.*) that the court of common pleas existed as a distinct court before the conquest; and was not created by Magna Charta, at which time there were "justiciarii de Banco, &c.:" although before this act, common pleas might have been held "in Banco regi;" and all original writs were returnable there. According to Madox, the origin of the court of common pleas is of a much later date than that assigned by lord Coke. He so far agrees with lord Coke as to admit, that the Magna Charta of Henry III. rather confirmed than created the "Bank," or "Common Pleas;" and that such a court was in being long before the Magna Charta of the 17th of king John; though it was then first made stationary. But in other respects they widely differ: for Mr. Madox thinks, that some time after the Conquest there was one great and supreme judicature, called the "Curia Regis," which he supposes to have been of Norman, and not Anglo-Saxon, original, and to have exercised jurisdiction over common as well as other pleas; that the common pleas and exchequer were gradually separated from the "Curia Regis," and became jurisdictions wholly distinct from it; and that the separation of the common pleas began in the reign of Richard I., or early in the reign of king John, and was completed by Henry III. (See Mad. Hist. Exch. 63. 539. fol. ed. Blackst. Com. iii. 27. 4 Inst. 99. 1 Inst. 71*b.*)

The jurisdiction of this court, which is general, and extends throughout England, is founded on original writs, issuing out of the chancery, which are the king's mandates for them to proceed on to determine such and such causes. But this is to be understood when the cause is between common persons; for when an attorney, or any person belong-

ing to the court, is plaintiff, he sues by writ of privilege, and is sued by bill, which is in nature of a petition; both which originally commence in the common pleas, and have no foundation in the chancery. 4 Inst. 99.

In all personal actions brought by and against common persons, the only way of proceeding in this court is by original. There is, indeed, one other way of proceeding in this court, in *common cases*, which is sometimes used; and which is called proceeding by "original quare clausum fregit." See CAPIAS.

All actions belonging to this court come hither, either by original, as arrests and outlawries; or by privilege or attachment, for or against privileged persons; or out of inferior courts, not of record, by *pone, recordare, accedas ad curiam, writ of false judgment, &c.* Actions popular, and actions penal, of debt, &c. upon any statute, are cognizable by this court; and, besides having jurisdiction for punishment of its officers and ministers, this court, without any writ, may, upon a suggestion only, grant prohibitions, to keep as well temporal as ecclesiastical courts within their bounds and jurisdiction. (4 Inst. 99. and Vaughan's Reports, p. 157.)

As pleas or suits are regularly divided into two sorts; *viz.* *pleas of the crown*, which comprehend all crimes and misdemeanors, wherein the king (on behalf of the public) is the plaintiff; and *common pleas*, which include all civil actions, depending between subject and subject; the former of these were the proper object of the court of king's bench; the latter of the court of common pleas, which is a court of record, and is styled by sir Edward Coke the lock and key of the common law:—for herein only can real actions, that is, actions which concern the right of freehold in the realty, be originally brought: and all other, or personal pleas between man and man, are likewise here determined; though in most of them the king's bench has also a concurrent authority.

The jurisdiction of each court is at this day so well established, that as the court of king's bench cannot determine a mere real action, so neither can the court of common pleas inquire of felony or treason. (2 Hawk. P. C. p. 2.)

In term time, this court may award a habeas corpus by the common law, for any person committed for any cause under treason or felony; and thereupon discharge him, if it shall clearly appear, by the return, that the commitment was against law, as being made by one who had no jurisdiction of the cause, or for a matter, for which, by law, no man ought to be punished. Vide Vaughan, 154. *siq.* 2 Jones, 14.

All civil causes, real, personal, and mixed, are tried in this court, according to the strict law of the realm. Forfeiture represents it as the only court for real causes. In personal and mixed actions it hath a concurrent jurisdiction with the king's bench. This court doth not possess any original jurisdiction; nor has it, like the court of king's bench, any mode of proceeding in common cases peculiar to itself.

The chief justice hereof is called *lord chief justice of the common pleas*, who is accompanied with three of his associates, called *justices*, created by letters patent, and as it were judges installed or placed on the common bench by the lord chancellor, and the lord chief justice of the court; to whom the seal of the court is committed. These judges sit every day in the four terms to hear and determine all matters of law arising in civil causes, whether real, personal, or mixed and compounded of both. These the court takes cognizance of, as well originally, as upon removal from the inferior courts. But a writ of error, in the nature of

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An appeal, lies from this court into the court of king's bench.

The other officers belonging to this court are, the custos brevium; three prothonotaries, or prænotaries, and their secondaries; a chirographer; nine filazers; four exigenters; clerk of the warrants; clerk of the juries, or jurata writs; clerk of the treasury; marshal and associate to the chief justice; clerk of the king's silver; clerk of the effoins; clerk of the outlawries; clerk of the errors. &c. whose several functions see in their places. *CUSTOS brevium*, *CHIROGRAPHER*, *EXIGENTER*, *CLERK*, &c. To these officers may be added a proclamator, a keeper of the court, cryer, and tipstaffs; besides the warden of the Fleet, there are also attorneys of this court, whose number is unlimited; and none may plead at the bar of the court in term-time, or sign any special pleadings, but sergeants at law.

Court of Commission of Review, is formed by a commission sometimes granted, in extraordinary cases, to revise the sentence of the court of delegates; when it is apprehended they have been led into any material error. This commission the king may grant, although the statutes 24 and 25 Henry VIII. declare the sentence of the delegates definitive; because the pope, as supreme head of the canon law, used to grant such commission of review; and such authority as the pope heretofore exerted is now annexed to the crown, by statutes 26 Hen. VIII. c. 1. and 1 Eliz. c. 1. But this is not matter of right which the subject may demand "ex debito iustitiæ," but only a matter of favour, and which is therefore often denied. 4 Inst. 341.

Court of High Commission, an ecclesiastical court erected and united to the regal power (4 Inst. 324.), by virtue of the statute 1 Eliz. c. 1. instead of a larger jurisdiction which had before been exercised under the authority of the pope. It was intended to vindicate the dignity and peace of the church, by reforming, ordering, and correcting the ecclesiastical state and persons, and all manner of errors, heresies, schisms, abuses, offences, contempts, and enormities. Under these general words, means were devised in that and the succeeding reigns, to vest in the high commissioners extraordinary and almost despotic powers of fining and imprisoning, which they exerted much beyond the degree of the offence itself, and frequently over offences by no means of spiritual cognizance. For these reasons the court was justly abolished by statute 16 Car. I. c. 11: and the weak and illegal attempt to revive it, during the reign of king James II. served only to hasten that infatuated prince's ruin. See *Hundred Court*.

Court of Conscience, *Curia conscientie*. In the 9th of Henry VIII. the *court of conscience*, or *court of requests*, in London, was erected: there was then made an act of common council, that the lord mayor and aldermen should assign monthly two aldermen and four discreet commoners, to be commissioners to sit in this court twice a week, to hear and determine all matters brought before them between party and party, between citizens and freemen of London, in all cases where the debt or damage was under forty shillings. And this act of common council is confirmed by the stat. 1 Jac. I. which empowers the commissioners of this court to make such orders between the parties touching such debts, as they shall find stand to equity and good conscience. Also the stat. 3 Jac. I. c. 15. since explained and amended by 14 Geo. II. c. 10. farther establishes this court; the course and practice whereof is by summons, to which, if the party appear, the commissioners proceed summarily; examining the witnesses of both parties, or the parties themselves, on oath; and as they see cause, give judgment. If the party summoned appear not, the commissioners have

power to apprehend and commit him: also the commissioners have power to commit a person refusing to obey their orders, &c. Vid. stat. 3 Jac. I.

By stat. 14 Geo. II. c. 10. the proceedings of the court of conscience are regulated; and in case any person affront or insult any of the commissioners, on their certifying it to the lord-mayor, he shall punish the offender by fine, not exceeding 20*s.* or may imprison him ten days. The time and expence of obtaining summary redress in this court are very inconsiderable, which renders it a great benefit to trade; and hence many trading towns and other districts have obtained acts of parliament for establishing in them courts of conscience upon nearly the same plan as that of London.

Court, Consistory. See *Bishop's Court* and *CONSISTORY*.

Court of the Coroner, is a court of record, to enquire when any one dies in prison, or comes to a sudden and violent death, by what manner he came to his end. See *CORONER*.

Court, County, is a court of justice, but not a court of record, held in each county by the sheriff thereof, or his deputy, every month. See *SHERIFF*.

This county court had anciently the cognizance of matters of great moment; but it was much abridged by Magna Charta, and more by 1 Edward IV. But it has still the determination of debts and trespasses under forty shillings. In effect, till the courts at Westminster were erected, the county courts were the chief courts of the kingdom.

Among the laws of king Edgar is this, *viz.* Let there be two county courts in a year, and let there be present a bishop and an alderman or earl; one whereof shall judge according to the common law, the other according to the ecclesiastical law.—The conjunction of these two powers to assist each other, is as ancient as the English government itself. They were first separated by William the Conqueror, who brought all the ecclesiastical business into a consistory, erected for that purpose; and the law business into the king's bench.

The dignity of this court was much impaired, when the bishop was prohibited, and the earl neglected to attend it. And in modern times, as proceedings are removable from hence into the king's superior courts, by writ of *pone* or *recordari*, in the same manner as from hundred courts and courts baron; and as the same writ of false judgment may be had, in nature of a writ of error, this has occasioned the same abuse of bringing actions into it.

The county-court may hold plea of many real actions, and of all personal actions to any amount, by virtue of a special writ called a "judicium," which is a writ empowering the sheriff for the sake of dispatch to do the same justice in his county-court as might otherwise be had at Westminster. The freeholders of the county are the real judges in this court, and the sheriff is the ministerial officer. The great confux of freeholders attending at the county-court is the reason why all acts of parliament at the end of every session were wont to be there published by the sheriff; why all outlawries of absconding offenders are there proclaimed; and why all popular elections made by the freeholders, as formerly of sheriffs and conservators of the peace, and still of coroners, verderors, and knights of the shire, must ever be made in *pleno comitatu*, or in full county-court. By the statute 2 Edw. VI. c. 25. no county-court shall be adjourned longer than for one month, consisting of 28 days, which appears to have been the ancient usage. See *Hundred Court*.

Courts of the Counties Palatine of Chester, Lancaster, and

and Durham, and of the *Royal Franchise* of Ely, are a species of private courts, with a limited and local jurisdiction, and having at the same time an exclusive cognizance of pleas, in matters both of law and equity. In these, as well as in the principality of Wales, the king's ordinary writs, issuing under the great seal out of chancery, are of no force; and since the privileges of these counties and franchises have been abridged, writs and process issuing in the king's name, must be witnessed in the name of the owner of the franchise. The judges of assize, who sit here, sit by virtue of a special commission from the owners of the several franchises, and under their seal, and not by the usual commission under the great seal of England. See *COUNTY Palatine*.

COURT of Delegates, is a court where delegates or commissioners are appointed by the king's commission, under the great seal, and issuing out of chancery, upon an appeal to him.

It is granted in three cases: first, when a sentence is given in an ecclesiastical cause, by the archbishop, or his official; secondly, when a sentence is given in an ecclesiastical cause, in places exempt; thirdly, when sentence is given in the admiralty court, in suits civil or marine, by order of the civil law. 4 Inst. 339. Stat. 25 Hen. VIII. c. 19.

This is the highest court for civil affairs concerning the church; for the jurisdiction whereof it was provided, 25 Hen. VIII. that it shall be lawful for the subject, in case of defect of justice in the ecclesiastical courts, to appeal to the sovereign in his court of chancery; whence a commission is directed under the great seal to particular persons therein mentioned, for redress of judgment. This commission is frequently filled with lords spiritual and temporal, and always with judges of the courts at Westminster, and doctors of the civil law. When the practice of appealing to them was set aside, and the jurisdiction usurped by the pope was restored to the crown, to which it originally belonged, (see *APPEAL*.) the statute 25 Henry VIII. was enacted as declaratory of the ancient law of the realm. (4 Inst. 341.) But in case the king himself be party in any suits, in which appeal is made, the appeal does not lie to him in chancery, which would be absurd; but by stat. 24 Hen. VIII. c. 12. to all the bishops of the realm, assembled in the upper house of convocation.

From the highest ecclesiastical court there lies no appeal but to the *court of delegates*; and beyond this to no other, except to the house of lords. But the king, of his free will, may grant a *commission of review*, under the great seal. The citations run all in the king's name. See *COMMISSION*, and *COURT of Commission of Review*.

COURT of the Duchy Chamber of Lancaster, a court of special jurisdiction, held before the chancellor of the duchy, or his deputy, concerning all matters of equity relating to lands holden of the king in right of the duchy of Lancaster, which is a thing very distinct from the county palatine (which hath also its separate chancery for sealing of writs, and the like), and comprises such territory which lies at a vast distance from it; as particularly a very large district surrounded by the city of Westminster. The proceedings in this court are the same as in the equity side in the courts of exchequer and chancery (4 Inst. 206.); so that it seems not to be a court of record:—and indeed it has been holden that these courts have a concurrent jurisdiction with the duchy court, and may take cognizance of the same causes. (1 Chan. Rep. 55. Toth. 145. Hard. 171.) The original of this court was in Henry the Fourth's time, who obtaining the crown by deposition of Richard II. and having the duchy of Lancaster by descent, in right of his mother, be-

came seized thereof as king, not as duke. So that all the liberties, franchises, and jurisdictions of the said county passed from the king, by his great seal, and not by livery, or attornment, as the earldom of March, and other possessions, which descended to him by other ancestors than the king's, did.

Henry IV. by authority of parliament, severed the possessions, liberties, &c. of the said duchy from the crown: but Edward IV. restored them to their former nature. See *COUNTY Palatine*.

The officers belonging to this court, which is held in Westminster-hall, are, a chancellor, attorney-general, receiver-general, clerk of the court, and messenger; beside the assistants, as an attorney in the exchequer, another in chancery, and four counsellors. See *CHANCELLOR* and *ATTORNEY of the Duchy*.

COURTS Ecclesiastical, Curia ecclesiastica, are those courts which are held by the king's authority, as supreme head of the church, for matters which chiefly regard religion. 4 Inst. 321. See *CHURCH* and *CLERGY*.

In the time of our Saxon ancestors there was no distinction between the lay and ecclesiastical jurisdiction; the county-court was as much a spiritual as a temporal tribunal: the rights of the church were ascertained and asserted at the same time, and by the same judges, as the rights of the laity. For this purpose, the bishop of the diocese, and the alderman, or in his absence the sheriff of the county, used to sit together in the county-court, and had there the cognizance of all causes as well ecclesiastical as civil:—a superior deference being paid to the bishop's opinion in spiritual matters, and to that of the lay judges in temporal. (Ll. Eadgar, c 5) But the church of Rome indulged views of ambition that were inconsistent with this rational and moderate plan; and in the papal system of policy, the ecclesiastical jurisdiction was to be sole and supereminent, lodged first in the pope, by divine indefeasible right and investiture from Christ himself, and derived from the pope to all inferior tribunals. It was not, however, till after the Norman conquest, that this doctrine was received in England, when William I., under the influence of the monasteries and foreign clergy, was induced to separate the ecclesiastical court from the civil. The consequence of this separation was, that the Saxon laws were soon overborne by the Norman justices, when the county-court fell into disregard by the bishop's withdrawing his presence, in obedience to the charter of the conqueror, which prohibited any spiritual cause from being tried in the secular courts, and commanded the suitors to appear before the bishop only, whose decisions were directed to be conformable to the canon law. King Henry I., among other restorations of the laws of king Edward the Confessor, revived the union of the civil and ecclesiastical courts; thus, according to sir Edward Coke, restoring the ancient laws of England. The popish clergy, however, infligated by the arrogant archbishop Anselm, disapproved the measure, and in their synod at Westminster, 3 Hen. I. ordained that no bishop should attend the discussion of temporal causes; and thus the newly-effected union was soon dissolved. Upon the death of Henry I., the usurper Stephen, brought in and supported by the clergy, proposed an oath, that ecclesiastical persons and ecclesiastical causes should be subject only to the bishop's jurisdiction. About this time the contest and emulation between the laws of England and those of Rome commenced; the temporal courts adhering to the former, and the spiritual adopting the latter, as their rule of proceeding; and thus the breach between them was widened, and a coalition afterwards became impracticable, which

might probably have been otherwise effected at the reformation of the church.

The laws and constitutions by which the church of England is governed, are divers immemorial customs; our own provincial constitutions and the canons made in convocations, particularly those of 1603. statutes or acts of parliament concerning religion or causes of ecclesiastical cognizance, especially the rubrics in our common prayer book, founded upon the statutes of uniformity; and the articles of religion drawn up in 1562, "articuli cleri," 9 E. 2. and established by 33 Eliz. c. 12.; and as it is said, the canon law, where all others fail.

The suits in spiritual or ecclesiastical courts, are for the reformation of manners, for punishing of heresy, defamation, laying violent hands on a clerk, and the like; and some of their suits are to recover tythes, legacies, contracts of marriage, &c. and in causes of this nature, the courts may give costs, but not damages. Things that properly belong to these jurisdictions, are matrimonial and testamentary; and defamatory words for which no action lies at law, as for calling a person adulterer, fornicator, usurer, or the like. 11 Rep. 54. Dyer. 240. The proceedings in the ecclesiastical courts are according to the civil and canon law; by citation, libel, answer upon oath, proof by witnesses, and presumptions, &c. and after sentence for contempt, by excommunication: and if the sentence is disliked, by appeal. The jurisdiction of these courts is voluntary or contentious; and the punishments inflicted by them, are censures and punishments *pro salute anime*, by way of penance, &c. They are not courts of record. See AUDIENCE.

These courts having contributed to the exercise of grievous oppression on persons charged with trivial offences within their spiritual jurisdiction, the statute 27 Geo. III. c. 44. limits the time of commencing suits for defamatory words to six months; and for incontinence and beating in the church-yard to eight months.

COURT of Enquiry, in Military Matters, a meeting or assemblage of officers, who are empowered and authorized to enquire into the conduct of the commander of an expedition, a corps, or a party: or to examine and investigate whether there be sufficient ground for a court martial on such part or parts of a person or persons conduct as is or are submitted to their consideration. Courts of enquiry cannot themselves award punishment, but must report the result of their investigations to the officer, by whose orders they were assembled. Courts of enquiry are also appointed to examine into the quality and distribution of military or warlike stores.

COURT of Exchequer, an ancient court of record, in which all causes touching the revenue and rights of the crown are heard and determined; and where the revenues of the crown are received. It is called the exchequer, *scaccharium*, as some say, from the chequer-wrought carpet, resembling a chess-board, which covered the table in that court; and on which, when certain accounts of the king are made up, the same are marked and scored with counters. Others say, that it derived its name from the pavement of the court, which was chequered; and others refer the origin of its appellation to the chequers, or chess-boards, used in their computations by the accountants in their office. This court, though inferior in rank not only to the court of king's bench, but also to the common pleas, is nevertheless very ancient; and the institution of it is ascribed to William the Conqueror, who formed the plan of it from the exchequer in Normandy, with many important alterations. Some persons have suggested that there was an exchequer under the Anglo-Saxon kings; but the most approved writers ascribe the introduction of it to William I. who esta-

blished it, as part of the *aula regia*. It was, however, regulated and reduced to its present order by Edward I.; and is intended principally to order the revenues of the crown, and to recover the king's debts and duties. (4 Inst. 103. 116.) It consists of two divisions; the receipt of the exchequer which manages the royal revenue, and the court or judicial part of it, which is again subdivided into a court of equity, and a court of common law.

On account of the authority and dignity of the court of exchequer, it was anciently held in the king's palace; and its acts were not to be examined or controuled in any other of the king's ordinary courts of justice. The exchequer was the great repository of records belonging to the other courts at Westminster, &c. which were brought to be laid up in the treasury there. Writs of the chancery were sometimes issued from the exchequer, and writs of summons to assemble parliament, &c. The exchequer has been commonly held at Westminster, the usual place of the king's residence; but it hath been sometimes holden in other places, at the king's pleasure. In the exchequer there are seven courts; *viz.* the court of pleas; the court of accounts; the court of receipts; the court of the exchequer chamber, (being the assembly of all the judges of England for difficult matters in law;) the court of exchequer-chamber for errors in the court of exchequer; for errors in the king's bench: and the court of equity in the exchequer-chamber. (4 Inst. 119.) However, for the dispatch of all common business, the exchequer, as we have already observed, is divided into two parts; one conversant, more especially in the judicial hearing and deciding of causes pertaining to the prince's coffers, anciently called "*scaccharium computorum*," and the other, the receipt of the exchequer, which is employed in the receiving and disbursing of money. By statute, all sheriffs, bailiffs, &c. are to account in the exchequer before the treasurer and barons, and annual rolls are to be made of the profits of counties, &c. Also inquisitions shall be appointed in every county, of debts due to the king. (51. Hen. III. st. 5. 10 Edw. I. stat. Rutl.) And all fines of counties for the whole year are to be sent into the exchequer. (Stat. de vicecom. 14 Ed. II. c. 1.) Persons impeached in the exchequer may plead in their own discharge; and there shall be writs for discharging persons, &c. (5 Ric. II. c. 10. 14.) The officers of the receipt may receive and take for their fees *1d.* in the pound for sums issued out, &c. (5 & 6 W. & M. c. 16.) Officers of the exchequer are without delay to receive money brought thither; and the money on the receipt is to be kept in chests under three different locks and keys, kept by three several officers, &c. (8 & 9 W. III. c. 28.)

The court of equity, is held in the exchequer-chamber before the lord-treasurer, the chancellor of the exchequer, the lord chief baron, and three *puijné* barons. These Mr. Selden (Tit. Hon. 2. 5. 16.) conjectures to have been anciently made out of such as were barons of the kingdom, or parliamentary barons, and thence to have derived their name, which conjecture is much strengthened by Bracton's explanations of magna charta (c. 14.) which directs that the earls and barons be amerced by their peers, that is, says he, by the barons of the exchequer. In this court there also sits a *curfitor baron*; which see.

The primary and original business of this court is to call the king's debtors to account by bill filed by the attorney-general, and to recover any lands, tenements, or hereditaments, any goods, chattels, or other profits or benefits, belonging to the crown, so that by their original constitution the jurisdiction of the courts of common-pleas, king's bench, and exchequer, was entirely separate and distinct: the common

pleas being intended to decide all controversies between subject and subject; the king's bench to correct all crimes and misdemeanors that amount to a breach of the peace, the king being the plaintiff, as such offences are in open derogation of the *jura regalia* of his crown; and the exchequer to adjudge and recover his revenue, wherein the king also is plaintiff, as the withholding and non-payment thereof is an injury to his *jura fiscalia*. But, as by a fiction almost all sorts of civil actions are now allowed to be brought in the king's bench, in like manner by another fiction all kinds of personal suits may be prosecuted in the court of exchequer. For as all the ministers and officers of this court have, like those of other superior courts, the privilege of suing and being sued, only in their own court; so also the king's debtors and farmers, and all accountants of the exchequer, are privileged to sue and implead all manner of persons in the same court of equity, into which they themselves are called. They have likewise privilege to sue and implead one another, or any stranger, in the same kind of common law actions (where the personalty only is concerned) as are prosecuted in the court of common pleas. This gives original to the *common law* part of their jurisdiction, which was established merely for the benefit of the king's accountants, and is exercised by the barons only of the exchequer, and not the treasurer or chancellor. The writ upon which all proceedings here are grounded is called a *quo minus*: in which the plaintiff suggests that he is the king's farmer or debtor, and that the defendant hath done him the injury or damage complained of; *quo minus sufficiens existit*, in which he is the less able to pay the king his debt or rent. And these suits are expressly directed, by what is called the statute of Rutland, (10 Edw. I. c. 11.) to be confined to such matters only, as specially concern the king or his ministers of the exchequer. And by the *articuli super cartas* (28 Edw. c. 4.) it is enacted, that no common pleas be thenceforth holden in the exchequer, contrary to the form of the great charter. But now by the suggestion of privilege, any person may be admitted to sue in the exchequer as well as the king's accountant. The surmise of being debtor to the king is, therefore, become matter of form and mere words of course, and the court is open to all the nation equally. The same holds with regard to the *equity* side of the court; for there any person may file a bill against another upon a bare suggestion that he is the king's accountant; but whether he is so, or not, is never controverted. In this court, on the equity side, the clergy have long been accustomed to exhibit their bills for the non-payment of tithes, in which case the surmise of being the king's debtor is no fiction, they being bound to pay him their first-fruits and annual tenths. But the chancery has of late years obtained a large share in this business. In the court of equity the proceedings are by English bill and answer, agreeably to the practice of the high court of chancery. In this court the attorney-general brings bills for any matters concerning the king; and any person, grieved in any cause prosecuted against him on behalf of the king, may bring his bill against the attorney-general to be relieved in equity, in which case the plaintiff must attend the king's attorney with a copy of the bill, and procure him to answer the same; and the attorney-general may call any that are interested in the cause, or any officer or others, to instruct him in framing his answer, so that the king be not prejudiced by it; and his answer is to be put in without oath. (4 Inst. 119, 112, 118.)

An appeal from the equity side of this court lies immediately to the house of peers; but from the common law side, in pursuance of the statute 31 Edw.

III. c. 12. a writ of error must first be brought into the court of exchequer-chamber. And from the determination there had, there lies, in the *dernier resort*, a writ of error to the house of lords. The chancellor, or undertreasurer, hath the custody of the seal of this court. See CHANCELLOR of the Exchequer. For the office of the attorney-general, see that article. See also REMEMBRANCER, CHAMBERLAIN, CLERK and COMPTROLLER of the Pipe, CLERK of the *Escheats*, Foreign OPPOSERS, AUDITOR, TELLER, CLERK of the Pells, CLERK of the *Nihilis*, CLERK of the Pleas, &c. &c.

By 23 Geo. III. c. 82, the officers of the two chamberlains, the tally cutter, usher of the exchequer, and the second clerks to each teller, shall, after the death, surrender, forfeiture, or removal of the persons interested in them, be abolished. Upon the death, &c. of the two chamberlains, instead of the tally now used to denote the receipt of money, there shall be substituted an indented cheque receipt. And upon the death, &c. of the usher, the chief officer in each office shall supply his place. After the death, &c. of the present auditor, clerk of the pells, either of the four tellers, or two chamberlains, the payment of all salaries, fees, and emoluments to the said officers, shall cease, and in lieu thereof, certain annual salaries are made payable, *viz.* to the auditor 4000*l.*, his chief clerk 1000*l.*, clerk of the pells 3000*l.*, his first clerk 1000*l.*; the four tellers each 2700*l.*, and each of their first clerks 1000*l.* There are to appoint such other clerks and officers as they think fit, to be approved by the treasury. All fees as heretofore (see stat. 26 Geo. III. c. 99.) to be received by the first clerk to the clerk of the pells; (200*l.* of whose salary is on that account;) two-thirds thereof to be applied to the sinking fund, and one-third to pay the above salaries. The houses of the auditor, four tellers, and usher, shall, after the death, &c. of the present possessors, be vested in his majesty, and not annexed to the offices. And no office in the receipt of the exchequer may be granted either in possession or reversion, in any other manner, than subject to this act.

The court of exchequer in Scotland has the same power, authority, privilege, and jurisdiction over the revenue of Scotland, as the court of exchequer in England has over the revenues there; and all things and matters competent to the court of exchequer in England, so far as they relate to the king's revenue, are likewise competent to the exchequer of Scotland, with these limitations, *viz.* that no debt due to the crown shall affect the debtor's real estate in any other manner than such estate may be affected by the laws of Scotland; and that the validity of the crown's titles to any honours or lands shall continue to be tried by the court of session. The judges are likewise invested with the power of passing signatures, gifts, and tutories, and to revise and compound them in the same manner as was done by the lord high treasurer, commissioners of the treasury, and court of exchequer in Scotland, before the union. But though all these must pass in exchequer, it is the court of session only that can judge of their preference, after they are completed. This court consists of the lord high treasurer of Great Britain, and a chief baron, with some other barons of the exchequer; and all serjeants at law, barristers at law, of five years standing, in any of the four inns of court of England, and advocates of five years standing, in the college of justice in Scotland, are qualified for being barons of this court; whose commissions are "quam diu se bene gesserint."

COURT of Exchequer Chamber, a court of appeal for correcting the errors of other jurisdictions; first erected by statute 31 Edw. III. c. 12. to determine causes upon writs of

error for the common law side of the court of exchequer. To that end it consists of the lord chancellor and lord treasurer, taking unto them the justices of the king's bench and common pleas. In imitation of this, a second court of exchequer chamber was erected by statute 27 Eliz. c. 8. consisting of the justices of the common pleas and the barons of the exchequer, before whom writs of error may be brought, to reverse judgments in certain suits originally begun in the court of king's bench. In this court there are no more than two return-days in every term; one called the general "affirmance-day," appointed by the judges to be held a few days after the commencement of every term, for the general affirmance or reversal of judgments; the other the "adjournment-day," usually held a day or two before the end of every term. On the first of these days, judgments are affirmed or reversed, or writs of error non-prossed; the intent of the latter is to finish such matters as were left undone at the former;—on which last day (as well as on the first) judgments may be affirmed or reversed, or writs of error non-prossed, on paying a fee extraordinary to the clerk of the errors, and setting down the cause for affirmance two days before the adjournment-day. (Impey, K. B. 678.)

Into the court of exchequer chamber (which then consists of all the judges of the three superior courts, and now and then the lord chancellor also), are sometimes adjourned from the other courts such causes as the judges, upon argument, find to be of great weight and difficulty, before any judgment is given upon them in the court below. (4 Inst. 119. 2 Bullr. 146.)

COURT of *Faculties* in England, belongs to the archbishop of Canterbury, and his chief officer is called "magister ad facultates." His power, by the stat. 25 Hen. VIII. c. 21. is to grant dispensations, as to marry persons without the bans being first asked, (and every diocesan may make the like grants,) to ordain a deacon under age, for a son to succeed the father in his benefice, one person to have two or more benefices incompatible, &c. And in this court are regulated the certificates of bishops and noblemen granted to their chaplains, to qualify them for pluralities and non-residence. (4 Inst. 337.)

The office where such dispensations are taken out, is also called the *Faculty office*.

COURTS of *Forest*, are courts of private and special jurisdiction, instituted for the government of the king's forests in different parts of the kingdom; and for the punishment of all injuries done to the king's deer or venison, to the vert or greenfeld, and to the covert, in which such deer are lodged. These are the courts of *Attachments*, of *Regard*, of *Sevinmote*, and of *Justice-seat*; which see respectively.

COURT, *Hundred*, is a larger *Court-baron* held for all the inhabitants of a particular hundred, instead of a manor. The free suitors are here the judges, and the steward the regillrar, as in the case of a court-baron. This is likewise no court of record; resembling the former in all points, except that in point of territory it is of a greater jurisdiction. (Finch. L. 248. 4 Inst. 267.) Sir Edward Coke says, (2 Inst. 71.) that this was derived out of the county-court, for the ease of the people, that they might have justice done them at their own doors, without any charge or loss of time; but its institution was probably coeval with that of hundreds themselves, which seem to have been introduced, though not invented, by Alfred, being derived from the polity of the ancient Germans. (See HUNDRED.) Cæsar (De Belli. Gall. l. vi. c. 2.) speaks positively of the judicial power exercised in their hundred courts and court-baron. And Tacitus (De Morib. Germ. c. 13.) informs us not only of the authority of the lords, but of that of the

centeni, the hundredors or jury; who were taken out of the common freeholders, and had themselves a share in the determination. This hundred-court was denominated "hæreda" in the Gothic institution. But this court, as all causes are equally liable to removal from hence, as from the common court-baron, and by the same writs, and may also be reviewed by writ of false judgment, is therefore fallen into equal disuse with regard to the trial of actions.

Judge Blackstone observes, that many inconveniences have arisen from the disuse of the ancient county and hundred-courts; in which causes of small value were always formerly decided, with very little trouble and expence to the parties. This mode he thinks much preferable to that of multiplying courts of conscience, in derogation of the common law, and by vesting in standing commissioners large discretionary powers, which tend to create a petty tyranny; and which, by a disuse of the trial by jury, may tend to estrange the minds of the people from that valuable prerogative of Englishmen. He therefore wishes, that the proceedings in the county and hundred-courts could again be revived, and duly regulated. The experiment, he says, has been actually tried, and has succeeded in the populous county of Middlesex, and this might serve as an example to others. For by statute 23 Geo. II. c. 33. it is enacted, 1. That a special county-court shall be held at least once a month in every hundred of the county of Middlesex, by the county-clerk. 2. That twelve freeholders of that hundred, qualified to serve on juries, and struck by the sheriff, shall be summoned to appear at such court by rotation; so as none shall be summoned oftener than once a year. 3. That in all causes, not exceeding the value of 40s., the county-clerk and twelve suitors shall proceed in a summary way, examining the parties and witnesses on oath, without the formal process anciently used; and shall make such order therein as they shall judge agreeable to conscience. 4. That no plaints shall be removed out of this court, by any process whatsoever; but the determination herein shall be final. 5. That if any action be brought in any of the superior courts against a person resident in Middlesex, for a debt or contract, upon the trial of which the jury shall find less than 40s. damages, the plaintiff shall recover no costs, but shall pay the defendant double costs; unless upon some special circumstances, to be certified by the judge who tried it. 6. A table of very moderate fees is prescribed and set down in the act; which are not to be exceeded upon any account whatsoever. This, says the learned judge, is a plan entirely agreeable to the constitution and genius of the nation; calculated to prevent a multitude of vexatious actions in the superior courts, and at the same time to give honest creditors an opportunity of recovering small sums; which they are now frequently deterred from by the expence of a suit at law:—a plan which, one would think, wants only to be generally known, in order to its universal reception.

COURT of *Hustings*, a court of record, held before the lord mayor and aldermen of London, the sheriffs, and recorder, in Guildhall. 4 Inst. 247.

Of the great antiquity of this court we find this mention in the laws of king Edward the Confessor. "Debet etiam in London. quæ est caput regni & legum, semper curia domini regis singulis septimanis, die Lunæ *hustingis* sedere & teneri; fundata erat olim & ædificata ad instar & ad modum & in memoriam veteris magnæ Trogæ, & usque in hodiernum diem. leges. & jura & dignitates, & libertates regniæque consuetudines suas una semper inviolabilitate conservat." Taylor, Hist. of Gavel-kind.

The court of *hustings* is the principal and highest of all the courts of the city. This court determines all pleas, real, personal,

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personal, and mixt : and here all lands, tenements, and hereditaments, rents, and services within the city of London, and suburbs of the same, are pleadable in two haultings; the one called haultings of plea of lands, and the other called haultings of common pleas. Error or attain lies there of a judgment or false verdict in the sheriff's courts.

In the haultings of plea of lands are brought writs of right patent, directed to the sheriffs of London, on which writs the tenant shall have three summonses at the three haultings next following : and after the three summonses, there shall be three effoins at three other haultings next ensuing ; and at the next haultings after the third effoin, if the tenant makes default, process shall be had against him by *grand cape*, or *petit cape*, &c. If the tenant appears, the demandant is to declare in the nature of what writ he will, without making protestation to sue in nature of any writ : then the tenant shall have the view, &c. ; and if the parties plead to judgment, the judgment shall be given by the recorder ; but no damages, by the custom of the city, are recoverable in any such writ of right patent. In the haultings of common pleas are pleadable writs *ex gravi querela*, writs of *gavelet*, of *down*, *waste*, &c. ; also, writs of *exigent* are taken out in the haultings ; and at the fifth haultings the outlawries are awarded, and judgment pronounced by the Recorder.

If an erroneous judgment is given in the haultings, the party grieved may sue a commission out of chancery, directed to certain persons to examine the record, and thereupon do right. (1 Rol. Abr. 745.) From the judgment of justices appointed by the king's commission, a writ of error lies immediately to the house of lords. In the court of haultings the burgesses to serve for the city in parliament must be elected by the livery of the respective companies.

COURT, *Judiciary*. See JUSTICIARY.

COURT of *Justice*. See COURT of SESSION.

COURT of *King's Bench*, *Bancus Regius*, is the supreme court of common law in the kingdom ; so called, because the king used formerly to sit there in person, the style of the court still being *coram ipso rege*. (4 Inst. 73.) During the reign of a queen, it is called "queen's bench," and during the usurpation of Cromwell, it was denominated "upper bench." This court consists of a chief justice, and three *puisné* justices, (formerly four or five) who are by their office the sovereign conservators of the peace, and supreme coroners of the land. Although the king himself used to sit in this court, and is still supposed to do so ; yet he did not, neither by law is he empowered to, determine any cause or motion, but by the mouth of his judges, to whom he hath committed his whole judicial authority. In the *aula regia*, indeed, the king used to decide causes in person. After its dissolution, king Edward I. frequently sat in the court of king's bench, and in later times, James I. is said to have sat there in person, but he was informed by his judges that he could not deliver an opinion. This court, which is the remnant of the *aula regia*, mult, from its nature, follow the king's person wherever he goes ; and, therefore, all process issuing out of this court in the king's name is returnable "ubique fuerimus in Anglia." For some centuries past it hath usually sat at Westminster, being an ancient palace of the crown ; but it might remove any where else, and its moveable quality, as well as its dignity and power, is fully expressed by Bracton (l. 3. c. 10.) and is specially provided for by the "articuli super cartas," (28 Edw. I. c. 5.)

This court hath always retained a supreme original jurisdiction in all criminal matters, the process issuing from, and

being returnable into it ; but in trespass it might be made returnable into either the king's bench or common pleas, because the plea was criminal as well as civil.

The jurisdiction of this court is very high and transcendent. It keeps all inferior jurisdictions within the bounds of their authority, and may either remove their proceedings to be determined here, or prohibit their progress below. It superintends all civil corporations in the kingdom. It commands magistrates and others to do what their duty requires, in every case where there is no other specific remedy. It protects the liberty of the subject, by speedy and summary interposition. It takes cognizance both of criminal and civil causes ; the former in what is called the *crown-side*, or *crown-office* ; the latter in the *plea-side* of the court.

On the *crown-side*, or *crown-office*, it takes cognizance of all criminal causes, from high treason, down to the most trivial misdemeanour or breach of the peace. Into this court also indictments from all inferior courts may be removed by way of *certiorari*, and tried either at bar, or at *nisi prius*, by a jury of the county out of which the indictment is brought. The judges of this court are the supreme coroners of the kingdom ; and the court itself is the principal court of criminal jurisdiction known to the laws of England. On this account, by the coming of the court of king's bench into any county, all former commissions of *oyer* and *terminer*, and general gaol-delivery, are at once absorbed and determined *ipso facto*. (4 Inst. 173. 2 Hawk. P. C. c. 3.) With regard, however, to the session of gaol-delivery for Middlesex, the statute 25 Geo. III. c. 18. enacts, that when any session of *oyer* and *terminer*, and gaol-delivery of the gaol of Newgate, for the county of Middlesex, shall have begun to be holden before the effoin day of any term, the same sessions shall continue to be holden, and the business finally concluded, notwithstanding the happening of such effoin day of any term, or the sitting of his majesty's court of king's bench at Westminster, or elsewhere, in the county of Middlesex ; and that all trials, &c. had at such session so continued to be holden, shall be good and effectual, to all intents and purposes. Into this court of king's bench reverted all that was good and salutary of the COURT of *Star-Chamber* ; which see.

This court is often termed the *custos morum* of all the realm ; and wherever it meets with an offence contrary to the first principles of justice, and of dangerous consequence, if not restrained, it may adapt a proper punishment to it. For the better restraining such offences, it has a discretionary power of inflicting exemplary punishment on offenders, either by fine, imprisonment, or other infamous punishment, as the nature of the crime, considered in all its circumstances, shall require. It may make use of any prison which shall seem most proper ; and it is said, that no other court can remove or bail persons condemned to imprisonment by this court. (2 Hawk. P. C. c. 3. § 5.)

An act of parliament, appointing, that all crimes of a certain denomination, shall be tried before certain judges, does not exclude the jurisdiction of this court, without express negative words ; and therefore it has been resolved, that the statute 33 Hen. VIII. c. 12, which enacts, that all treasons, &c. within the king's house, shall be determined before the lord steward of the king's house, does not restrain the court of king's bench from proceeding against such offences. (2 Inst. 549.) But where a statute creates a new offence, which was not taken notice of by the common law, and erects a new jurisdiction for the punishment of it, and prescribes a certain method of proceeding, it seems questionable how far this court has an implied jurisdiction.

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action in such a case. (1 Sid. 296. 2 Hawk. P. C. c. 3. § 6.)

The judges of this court are the sovereign justices of oyer and terminer, gaol-delivery, conservators of the peace, &c. and also the sovereign coroners; and therefore, where the sheriffs and coroners may receive appeals by bill, *a fortiori*, the judges may. Also this court may admit persons to bail in all cases according to their discretion. (4 Inst. 72. 9 Co. 118. b. 4 Inst. 74. Vaugh. 157.)

In the county where the king's bench sits, there is every term a grand inquest for presenting all criminal matters arising within that county, and then the court proceeds upon indictments so taken; or if, in vacation, there be any indictment of felony before the justices of peace of oyer and terminer, or gaol-delivery, there sitting, it may be removed by *certiorari* into B. R. and there they proceed *de die in diem*. (2 Hale's Hist. P. C. 3.) It may award execution against persons attainted in parliament, or any other court; when the record of their attainder, or a transcript is removed, and their persons brought thither by *habeas corpus*. (Cro. Car. 176. Cro. Jac. 495.)

Pardons of persons condemned by former justices of gaol-delivery ought to be allowed in B. R.; the record and prisoner being removed thither by *certiorari* and *habeas corpus*. (2 Hawk. P. C. c. 6. § 19.)

On the *plea* side, or civil branch, of this court, it hath an original jurisdiction and cognizance of all actions of trespass, or other injury alleged to be committed *vi et armis*; of actions for forgery of deeds, maintenance, conspiracy, deceit, and actions on the case which allege any falshood or fraud; all of which favour of a criminal nature, although the action is brought for a civil remedy; and make the defendant liable in strictness to pay a fine to the king, as well as damages to the injured party. (Finch. L. 198. 2 Inst. 23.) The same doctrine is also now extended to all actions of the case whatsoever. (F. N. B. 86, 92. 1 Lilly, pract. reg. 503.) but no action of debt or detinue, or other mere civil action, can by the *common law* be prosecuted by any subject in this court, by *original* writ out of chancery. (4 Inst. 76.); though an action of debt, given by *statute*, may be brought in the king's bench as well as in the common pleas. (Carth. 234.) And yet this court might always have held plea of any civil action (other than actions real) provided the defendant was an officer of the court, or in the custody of the marshal, or prison-keeper, of this court; for a breach of the peace, or any other offence. (4 Inst. 71.) And in process of time, it began by a fiction to hold plea of all personal actions whatsoever, and has continued to do so for ages (Ibid. 72.); it being surmised that the defendant is arraigned for a supposed trespass, which he never has in reality committed; and, being then in the custody of the marshal of this court, the plaintiff is at liberty to proceed against him for any other personal injury; which surmise, of being in the marshal's custody, the defendant is not at liberty to dispute.

These fictions of law, though at first they may startle the student, he will find, upon farther consideration, to be highly beneficial and useful; especially as this maxim is ever invariably observed, that no fiction shall extend to work an injury; its proper operation being to prevent a mischief, or remedy an inconvenience, that might result from the general rule of law. (3 Rep. 30. 2 Roll. Rep. 502.) So true it is, that *in fitione juris semper subsistit equitas*. (11 Rep. 51. Co. Litt. 150.) In the present case, it gives the suitor his choice of more than one tribunal, before which he may institute his action; and prevents the circuit and delay of justice, by allowing that suit to be originally, and in the

first instance, commenced in this court, which, after a determination in another, might ultimately be brought before it on a writ of error.

Although common pleas cannot be immediately holden in *Banco Regis*, because such pleas must be held in a certain place, without following the king's court, whence the court of king's bench cannot determine a mere real action; yet, when there is a defect in the court, in which, by law, they are holden originally, they may be holden in B. R.; as if a record come out of the common pleas by writ of error; so where the plea in a writ of right is removed out of the county by a *pone* in B. R. on a writ of *mesne replevin*, &c. (2 Inst. 23. 4 Inst. 72, 113. Saund. 256. Shaw. P. C. 57.) Thus, any action, *vi et armis*, where the king is to have fine, as ejectment, trespass, forcible entry, &c. being of a mixed nature, may be commenced in B. R. (2 Inst. 23.) Also any officer or minister of the court entitled to the privilege thereof may be there sued by bill in debt, covenant, or other personal action; for the act takes not away the privilege of the court. (2 Inst. 23. 4 Inst. 71. 2 Bulltr. 123.)

This court is likewise a court of appeal, into which may be removed, by writ of error, all determinations of the court of common pleas, and of all inferior courts of record in England; and to which a writ of error lies also from the court of king's bench in Ireland. Yet even this so high and honourable court is not the *dernier resort* of the subject; for, if he be not satisfied with any determination here, he may remove it by writ of error into the house of lords, or the court of exchequer-chamber, as the case may happen, according to the nature of the suit, and the manner in which it has been prosecuted. This court has not only the power to reverse erroneous judgments, for such errors as appear the defect of the understanding; but also to punish all inferior magistrates, and all officers of justice, for wilful and corrupt abuses of their authority against the obvious principles of natural justice. (2 Hawk. P. C. c. 3. § 10. Vaugh. 157. 1 Salk. 201.)

This court grants writs of *habeas corpus* to relieve persons wrongfully imprisoned, and may bail any person whatsoever. Writs of *mandamus* are granted by this court, to restore officers in corporations, colleges, &c. unjustly turned out; and freemen wrongfully disfranchised:—also, writs and informations in the nature of a *quo warranto* against persons, or corporations, usurping franchises and liberties against the king; and on misuser of privileges to seize the liberties, &c. In this court also the king's letters patent may be repealed by *scire facias*, &c. *Prohibitions* are also issued from this court to keep inferior courts within their proper jurisdiction.

The officers of this court, on the *crown*-side, are the king's coroner and attorney, commonly called the clerk of the crown, or master of the crown-office, who taxes costs, nominates all special juries on the crown-side, takes recognizances, inquisitions upon the death of any prisoner dying in the king's bench prison, &c.:—the secondary, who draws up the paper-books, and makes up an extract of all fines, &c. forfeited to the crown:—clerk of the rules:—the examiner; and calendar-keeper:—and clerks in court.

The officers on the *plea*-side are, the chief clerks; secondary, or master; their deputy, marshal, clerk of the rules, clerk of the papers, clerk of the day-rules, clerk of the dockets, clerk of the declarations, clerk of the bail, *Posteas*, and *etreats*, signers of writs, signer of the bills of Middlesex, *Custodes Brevirum*, clerk of the upper treasury, clerk of the outer treasury, flazer, exigenter, clerk of the outlawries, clerk of the errors, deputy-marshal, marshal and associate to the chief justice,

justice, train-bearer, clerk of the *Nisi prius* in London and Middlesex, clerks of the *Nisi prius* to the different counties appointed by the *Custos Brevium*, crier at *Nisi prius* in London and Middlesex, receiver-general of the seal-office, criers, ushers, and tipstaffs. See SECONDARY, CUSTOS BREVIVM, CLERK of the Papers, of the Declarations, of the Errors, of the Buils, of the Rules, &c. SIGNER and SEALER, FILAZER, MARSHAL, CRYER, &c.

In this court there are two modes of proceeding; *viz.* by *original writ*, or by *bill*. The former is generally used when the debt is large, because the defendant, if he means to delay execution of the judgment, must bring his writ of error returnable in parliament, which greatly enhances the expence; but the latter is more expeditious.

COURT *leet*, or *View of Frank-pledge*, is a court of record, said to be the most ancient in the land for criminal matters, and to have been co-eval with the establishment of the Saxons here. See FRANK-PLEDGE and LEET. This court is held once in the year or oftener, (commonly twice, *i. e.* within a month after Easter and a month after Michaelmas) within a particular hundred, lordship, or manor, before the steward of the leet; being the king's court granted by charter to the lords of those hundreds or manors; and it has the same jurisdiction within some particular precinct, as the sheriff's tourn hath in the county. Its original intent was to view the frank-pledges, that is, the freemen within the liberty: who, according to the institution of the great Alfred, were all mutually pledges for the good behaviour of each other. Besides this, the preservation of the peace, and the chastisement of divers minute offences against the public good, are the objects both of the court-leet and the sheriff's tourn:—which have exactly the same jurisdiction, one being only a larger species of the other; extending over more territory, but not over more causes. All freeholders within the precinct are obliged to attend them, and all persons commorant therein; which commorancy consists in usually lying there;—a regulation, which owes its original to the laws of king Canute. But persons under 12 and above 60 years old, peers, clergymen, women, and the king's tenants in ancient demesne, are excused from attendance there: all others being bound to appear upon the jury, if required, and to make their due presentments. It was also anciently the custom to summon all the king's subjects, as they respectively grew to years of discretion and strength, to come to the court-leet, and there take the oath of allegiance to the king. (2 Inst. 120, 121.) Here also, by immemorial usage and of common right, that most ancient constitutional officer the constable (4 Inst. 265.) and sometimes by prescription the mayor of a borough (see stat. 2 Geo. I. c. 4.) are elected and sworn. The other general business of the leet and tourn was to present by jury all crimes whatsoever that happened within their jurisdiction; and not only to prevent, but to punish, all trivial misdemeanors, as all trivial debts were recoverable in the court-baron, and county-court:—justice, in these minuter matters of both kinds, being brought home to the doors of every man by our ancient constitution. The suitors, elected, sworn, and charged to inquire into crimes and misdemeanors, proper for presentment, were not to be fewer than 12, nor more than 23; in some manors, they continued in office for a whole year; and in others they were sworn and discharged in the course of a day. If the offence be treason or felony, they must return the presentment (called in these cases an indictment) to the king's justices of *oyer and terminer*, and gaol-delivery. (See stats. W. II. c. 13. 1 Edw. III. fl. 2. c. 17.) The objects of the jurisdiction of the courts-leet and tourn were unavoidably more numerous;

being such as in some degree, either less or more, affect the public weal, or good governance of the district in which they arise; from common nuisances and other material offences against the king's peace and public trade down to caves-dropping, waifs, and irregularities in public commerce. Upon every presentment of the jury retained by the court, an amercement follows of course, which is afterwards assised, in open court agreeably to magna charta (c. 14.) by the *parcs curie*, that is, the peers or equals of the delinquent; and *assised* or reduced to a precise sum, by two or more suitors sworn to be impartial. (8 Rep. 39. stat. W. I. c. 6. 2 Inst. 27.) The amercements thus ascertained are then extracted, or extracted, from the roll or book in which the proceedings are recorded and levied by the bailiff, by distress and sale of the party's goods (8 Rep. 41.); by virtue of a warrant from the steward to that effect, or may be recovered by other means, as by process of *levari facias* (Hardr. 471.) or action of debt. (Bull. N. P. 167.) But both the courts, leet and tourn, have been for a long time in a declining way;—a circumstance, owing, in part, to the discharge granted by the statute of Marlbridge, 52 Hen. III. c. 10. to all prelates, peers, and clergymen from their attendance upon these courts, which occasioned their sinking into disrepute. Hence it is that their business hath for the most part gradually devolved upon the quarter-sessions; which it is particularly directed to do in some cases by statute 1 Edw. IV. c. 2.

COURT of the *Legate*, was a court obtained by cardinal Wolsey of pope Leo X. in the ninth year of Henry VIII. wherein he, as legate of the pope, had power to prove wills, and dispense with offences against the spiritual laws, &c. It was but of short continuance.

COURT of *Marshalsea*, a court of record, often confounded with the *palace court* at Westminster, though distinct, was originally holden before the steward of the king's house, and was instituted to administer justice between the king's domestic servants, that they might not be drawn to other courts, and thus deprive the king of their service. (1 Bullstr. 211.) It was formerly held in, though not a part of, the *Aula regia* (Flet. l. 2. c. 2.); and when this was subdivided, remained a distinct jurisdiction:—holding plea of all trespasses committed within the verge of the court, where only one of the parties is in the king's domestic service (in which case the inquest shall be taken by a jury of the country) and of all debts, contracts, and covenants, where both of the contracting parties belong to the royal household; and then the inquest shall be composed of men of the household only. (Art. super Cart. 28 Edw. I. c. 3. stat. 5 Edw. III. c. 2. 10 Edw. III. fl. 2. c. 2.) By the statute of 13 Ric. II. fl. 1. c. 3, (in affirmation of the common law, 2 Inst. 548.) the verge of the court in this respect extends for 12 miles round the king's place of residence. And as this tribunal was never subject to the jurisdiction of the chief justiciary, no writ of error lay from it (though a court of record) to the king's-bench, but only to parliament (1 Bullstr. 217. 10 Rep. 79.) till the statutes of 5 Edw. III. c. 2. and 10 Edw. III. fl. 2. c. 3. which allowed such writ of error before the king in his place. But this court being ambulatory, and obliged to follow the king in all his progresses, so that by the removal of the household, actions were frequently discontinued (F. N. B. 241. 2 Inst. 548.), and doubts having arisen as to the extent of its jurisdiction (1 Bullstr. 208.), king Charles I. in the sixth year of his reign, by his letters patent, created a new court of record, called the *Curia palatii*, or *palace court*, to be held before the steward of the household and knight-marshal, and the steward of the court, or his deputy; with jurisdic-

tion to hold plea of all manner of personal actions whatsoever, which shall arise between any parties within 12 miles of his majesty's palace at Whitehall. (1 Sid. 180. Salk. 439.) This court is now held once a week, together with the ancient court of marshalsea, in the Borough of Southwark. The proceedings here are either by *capias* or attachment: which is to be served on the defendant by one of the knight-marshal's men, who takes bond with sureties for his appearance at the next court; upon which appearance he must give bail to answer the determination of the court; and the next court after the bail is taken, the plaintiff is to declare, and set forth the cause of his action, and afterwards proceed to issue and trial by a jury, according to the custom of the common law courts. But if the cause is of any considerable moment, it is usually removed on its first commencement, together with the custody of the defendant, either into the king's bench or common pleas by an *habeas corpus cum causa*; or otherwise causes are here brought to trial in four or five court-days. The inferior business of this court hath of late years been much reduced, by the new courts of conscience in or near London; in consideration of which the four counsels belonging to this court had salaries granted them for their lives by the statute 23 Geo. II. c. 27. A writ of error lies from the marshalsea court to the court of king's bench. The fees of this court are limited by the statute 2 Hen. IV. c. 13. This marshalsea is that of the household; not the king's marshalsea, which belongs to the king's bench. See *Court of the Lord Steward, &c.*

Court martial, a court instituted for the trying and punishing of offences in officers, soldiers, sailors, and all persons, in short, that are subject to *martial law*: its powers and authorities are both conveyed and regulated by the acts of parliament passed for the enforcement and preservation of discipline in the army and navy. By the *mutiny act*, 1 W. & M. passed in 1689, and, with the interruption of about three years, from April 1698 to February 1701, annually renewed, for the regulation of the army, it is enacted, "that his majesty may, from time to time, grant a commission under his royal sign-manual, to any officer not under the degree of a field-officer, for holding a general court-martial within this realm; and also grant his warrant to the lord-lieutenant of Ireland, or other chief governor or governors there for the time being, or the governor or governors of Minorca, Gibraltar, and any of his majesty's dominions beyond the seas respectively, or the person or persons, their commander in chief, from time to time, to appoint courts-martial in the kingdom of Ireland, and other places and dominions respectively; in which courts-martial all offences mentioned in the articles of war, and all other offences herein-after specified, shall be tried and proceeded against in such manner as the act for that purpose directs." By the same act, the king is empowered to make new or additional articles of war, creating new offences, and to annex such punishments to them as he may think fit, not extending to life or limb. This is a power of great magnitude and extent; but as it has only an annual existence, there is but little danger of its being abused for the oppression of military subjects. Courts-martial have powers given to them to inflict, by their sentences, corporal punishment not extending to life or limb, on any soldier, for immoralities, misbehaviour, or neglect of duty. A general court-martial must not consist of a smaller number of officers than thirteen, whereof none are to be under the degree of a commissioned officer. And the president of such a court-martial must neither be the commander in chief, nor the governor of the garrison, where the offender shall be tried, nor under the degree of a field-officer, except when a field-officer cannot be had; in which case, the officer next

in seniority, not being under the degree of a captain, shall preside at such court-martial. And such court-martial is empowered and authorized to administer an oath to every witness on the examination or trial of any offences that shall be brought before them.

In all trials of offenders by general courts-martial, to be held in virtue and under authority of this act, every officer on such trials, before any proceedings be had thereupon, is required and obliged to take the following oaths upon the holy Evangelists, in the presence of the court and judge advocate, or his deputy, who is authorized to administer the same, in these words:

"You shall well and truly try and determine, according to the evidence in the matter now before you, between our sovereign lord the king's majesty and the prisoner to be tried. So help you God."

The oath is the following:

"I, A. B. do swear, that I will duly administer justice, according to the rules and articles for the better government of his majesty's forces, and according to an act of parliament now in force for the punishment of mutiny and desertion, and other crimes therein mentioned, without partiality, favour, or affection; and if any doubt shall arise, which is not explained by the said articles or act of parliament, according to my conscience, the best of my understanding, and the custom of war in the like cases. And I further swear, that I will not divulge the sentence of the court, until it shall be approved by his majesty, the general, or commander in chief; neither will I, upon any account at any time whatsoever, disclose or discover the vote or opinion of any particular member of the court-martial, unless required to give evidence thereof as a witness by a court of justice, in a due course of law. So help me God."

Immediately after this oath has been administered to the respective members of the court-martial, the president is authorized and required to administer to the judge advocate, or to the person officiating as such, an oath in the following words:

"I, A. B., do swear, that I will not, upon any account at any time whatsoever, disclose or discover the vote or opinion of any particular member of the court-martial, unless required to give evidence thereof as a witness by a court of justice, in a due course of law. So help me God."

And here it is observable, that neither the judge advocate, nor the person officiating as such, is restrained as the members are from disclosing the sentence of the court, until it shall be approved by his majesty, the general, or commander in chief. This appears to be a great and material omission on the part of the legislature, and has often operated injuriously to individuals.

No sentence of death can be given against any offender, by any general court-martial, unless nine officers present shall concur therein; and if there be more officers present than thirteen, then the judgment shall pass by the concurrence of two thirds of the number of them. And no proceeding or trial can be had upon any offence, but between the hours of eight o'clock in the morning and three in the afternoon, except in cases that require an immediate example. It is however provided, that the party tried by any general court-martial in the kingdom of Great Britain or Ireland, or in Jersey, Guernsey, Alderney, or Sark, or the islands therunto belonging, shall be entitled to a copy of the sentence and proceedings of such court-martial, upon demand thereof made either by himself, or by any other person or persons on his behalf, he or they paying reasonably for the same, at any time not sooner than three months after such sentence. And it is also provided, that in case of trials by

any general court-martial at Gibraltar or Minorca, the party shall be entitled to a copy of the sentence and proceedings thereof, at any time not sooner than six months after the giving of the sentence; and that in case of trials by any general court-martial in his majesty's other dominions beyond the seas, he shall be entitled to a copy of the same, at any time not sooner than twelve months after the sentence shall be given by the court, whether the sentence be approved or not.

It is also provided and enacted, that every judge advocate, or person officiating as such, at any general court-martial, shall transmit, as expeditiously as opportunity and the distance of place will permit, the original proceedings and sentence of such court martial to the judge advocate general in London; which original proceedings and sentence shall be carefully kept and preserved in the office of such judge advocate general, to the end that the persons entitled thereto may be enabled, upon application to the said office, to obtain copies thereof, according to the true intent and meaning of the act.

And it is likewise provided, declared, and enacted, that no officer or soldier, being acquitted or convicted of any offence, shall be liable to be tried a second time, by the same or any other court-martial, for the same offence, unless in case of an appeal from a regimental to a general court-martial; and that no sentence given by any court-martial, and signed by the president thereof, shall be liable to be revised more than once. It is also declared and enacted, that no officer or soldier shall be tried for any offence committed by him more than three years prior to the issuing of the warrant, unless he hath purposely absented himself to avoid such trial.

The judgments of courts-martial, besides being subject to the disapprobation of the king, or his commanders in chief, are, like those of other courts, liable to be taken cognizance of, and the members punished for illegal proceedings; for the court of king's bench, being the supreme court of common law, hath not only power to reverse erroneous judgments given by inferior courts, but also to punish all inferior magistrates, and all officers of justice, for all wilful and corrupt abuses of authority against the known, obvious, and common principles of justice. (2 Hawk. P. C. c. 3. § 10.—c. 27. § 22.) The mutiny-act directs, that every action against any member or minister of a court-martial, in respect to any sentence, shall be brought in some of the courts of record at Westminster. And many instances of such prosecutions have occurred in Westminster-hall. An officer, however, in a court-martial, is not liable to be punished for mere mistakes, which an honest well-meaning man may fall into. And if the plaintiff, or prosecutor, becomes nonsuited, or the defendant has a verdict, he shall recover treble costs. There is also another tribunal before which the proceedings of courts-martial are liable to *confure* at least, namely, the house of commons.

COURT Martial, regimental, cannot pronounce a sentence for inflicting any punishment which extends to the loss of life or limb. The colonel or commanding officer of the regiment approves the sentence of a regimental court-martial.

COURT Martial, garrison, or a *garrison court-martial*, resembles a regimental one in this respect, that the members composing it are not sworn, and that it is composed of officers of different regiments, instead of officers of one and the same corps. The sentence is approved of by the governor, or other commanding officer of the garrison.

COURTS, Mayor's. To the lord mayor and city of London, belong several courts of judicature. The highest and most ancient is that called the *hustings*, destined to secure

the laws, rights, franchises, and customs of the city. The second is a *court of request*, or of *conscience*; of which, before. The third is the *court of the lord mayor and aldermen*, where also the sheriffs sit: to which may be added two *courts of sheriffs*; and the *court of the city orphans*, whereof the lord mayor and aldermen have the custody. Also, the *court of common council*, which is a court or assembly, wherein are made all by-laws which bind the citizens of London. It consists, like the parliament, of two houses: an *upper*, consisting of the lord mayor and aldermen; and a *lower*, of a number of common council men, chose by the several wards, as representatives of the body of the citizens. In the *court of common council*, are made laws for the advancement of trade; and committees yearly appointed, &c. But acts made by them are to have the assent of lord mayor and aldermen, by stat. 21 Geo. I. c. 11. Also, the *chamberlain's court*, where every thing relating to the rents and revenues of the city, as also the affairs of servants, &c. are transacted. Lastly, to the lord mayor belong the *courts of coroner*, and of *escheator*; another *court for the conservation of the river of Thames*; another of *gaol delivery*, held usually eight times a year at the Old Bailey, for the trial of criminals, whereof the lord mayor is himself the chief judge. There are other *courts* called *wardmotes*, or meetings of the wards; and *courts of balymote*, or assemblies of the several guilds and fraternities.

COURTS of oyer and terminer, and general *gaol delivery*, are courts held before the king's commissioners, among whom are usually two judges of the courts at Westminster, twice in every year, in every county of the kingdom, except the four northern ones, where they are held only once, and London and Middlesex, where they are held eight times. See ASSISES, OYER and TERMINER, and GAOL-delivery.

COURT, Palace. See *Marshalsea COURT*.

COURT of Parliament. See PARLIAMENT.

COURT of Peculiars, is a spiritual court, which is a branch of, and annexed to, the *court of arches*; held in such parishes as are exempt from the jurisdiction of the bishops, and are peculiarly belonging to the archbishop of Canterbury. All ecclesiastical causes, arising within these peculiar or exempt jurisdictions, are originally cognizable by this court. 4 Inst. 338. Stat. 22 & 23 Car. II.

There are royal peculiars, and archbishop's peculiars; the king's chapel is a royal peculiar, exempted from all spiritual jurisdiction, and reserved to the immediate government of the king himself: and there are also some peculiar ecclesiastical jurisdictions belonging to the king, which formerly appertained to monasteries and religious houses.

There are some peculiars which belong to deans and chapters, or a prebendary exempted from the archdeacon only; they are derived from the bishop, of ancient composition, and may be visited by the bishop in his primary or triennial visitation: in the mean time, an official of the dean and chapter, or prebendary, is the judge; and from hence the appeal lies to the bishop of the diocese. Wood. 504. Appeal lieth from other *peculiar courts* to the king in chancery. Stat. 25 Hen. VIII. c. 19.

The dean and chapter of St. Paul's have a peculiar jurisdiction; and the dean and chapter of Salisbury have a large peculiar within that diocese; so have the dean and chapter of Litchfield, &c. 2 Nelf. Abr. 1240, 1241. Where a man dies intestate, leaving goods in several peculiars, it has been held that the archbishop is to grant administration. Sid. 90. 5 Mod. 239. Appeal lies to the king in chancery.

COURT of the House of Peers, is the supreme court of jurisdiction

jurisdiction in the kingdom; but has at present no original jurisdiction over causes, except only upon appeals and writs of error, to rectify any injustice or mistakes of the law, committed by the courts below; to which authority it succeeded of course upon the dissolution of the *Aula regia*. For as the barons of parliament were constituent members of that court, and the rest of its jurisdiction was dealt out to other tribunals, over which the great officers who accompanied these barons were respectively delegated to preside: it followed that the right of receiving appeals, and superintending all other jurisdictions, still remained in the residue of that noble assembly, from which every other great court was derived. They are therefore in all causes the last resort, from whose judgment no farther appeal is permitted: but every subordinate tribunal must conform to their determinations:—the law reposing an entire confidence in the honour and conscience of the noble persons who compose this important assembly, that (if possible) they would make themselves masters of those questions upon which they undertake to decide, and in all dubious cases refer themselves to the opinions of the judges, who are summoned by writ to advise them; since upon their decision all property must finally depend. See PEER.

COURT, *Pie-poudre, Curia pedis pulverizati*, an ancient court mentioned in many of our statutes, to be held in fairs, for the rendering of justice to buyers and sellers, and the redress of grievances arising in them.

It had its name, as some say, because it was most commonly held in summer, and the suitors were chiefly country clowns, with dully feet, called by the French *pieds poudreux*; or, according to others, as sir Edward Coke, from the expedition intended in the hearing of causes proper to it, before the dust fall off the plaintiff and defendant's feet; or rather, (as Barrington, in his "Observations on the Statutes,") suggests, from the old French *ped puldreaux, a pedlar*; signifying the court of such petty chapmen as resort to fairs or markets.

The Saxons called it *ceapung gemot, i. e. court of merchandize*; or a court for the decision of disputes relating to buying and selling. It is a court of record, incident to every fair and market. The steward, who has the toll of the market, is the judge: and the trial is by merchants and traders in the fair; so that the injury must be done, complained of, heard, and determined, within the compass of one and the same day, unless the fair continues longer. The court hath cognizance of all matters of contract that can possibly arise within the precinct of that fair or market; and the plaintiff must make oath that the cause of an action arose there. (Stat. 17 Edw. IV. c. 2.) A writ of error lies, in the nature of an appeal, to the courts at Westminster, (Cro. Eliz. 773.) which are now also bound by the statute 19 Geo. III. c. 70. to issue writs of execution, in aid of its process, after judgment; when the person or effects of the defendant are not within the limits of this inferior jurisdiction:—which may possibly occasion the revival of the practice and proceedings in these courts, which are now in a manner forgotten.

COURT of *Policies of Assurance*, a court formerly subsisting, which was erected in pursuance of the statute of 43 Eliz. c. 12:—but the course of arbitration according to this statute having been discontinued, and the assured having been led to bring separate actions at law against each insurer, the lord chancellor has been enabled yearly to grant a standing commission to the judge of the admiralty, the recorder of London two doctors of the civil law, two common lawyers, and eight merchants; any three of whom, one being a civilian or a barrister, are thereby, and by the

statute 13 & 14 Car. II. c. 23. empowered to determine in a summary way all causes concerning policies of assurance in London, with an appeal (by way of bill) to the court of chancery. But the jurisdiction being somewhat defective, as extending only to London, and to no other assurances but those on merchandize, and to suits brought by the assured only, and not by the insurers, no such commission has of late years issued;—but insurance causes are now usually determined by the verdict of a jury of merchants, and the opinion of the judges in case of any legal doubts: whereby the decision is more speedy, satisfactory, and final: though it is to be wished, says judge Blackstone, that some of the parliamentary powers invested in these commissioners, especially for the examination of witnesses, either before the seas, or speedily going out of the kingdom, (Stat. 13 & 14 Car. II. c. 22. § 3.) could at present be adopted by the courts of Westminster-hall, without requiring the consent of parties.

COURT, *Prerogative*, a court established for the trial of all testamentary causes, when the deceased hath left *bona notabilia* within two different dioceses, in which case the probate of wills belongs to the archbishop of the province, by way of special prerogative. And all causes relating to the wills, administrations, or legacies of such persons are, originally, cognizable herein, before a judge appointed by the archbishop, called the judge of the prerogative court.

All citations and decrees of this court run in the name of the archbishop.

This court, for the province of Canterbury, is kept in the common hall in Doctors Commons, in the afternoon, next day after the arches.

The judge is attended by the register, who sets down the decrees and acts of court; and keeps records, &c. all original wills and testaments of parties dying, having *bona notabilia*.

The place is usually called the *Prerogative office*: it is now kept in Dean's court; where, for a moderate fee, a copy may be had of any such will. See WILL.

Appeal lies from this court to the king in chancery, who appoints delegates, &c. 25 Hen. VIII. c. 19. though if the delegates revoke a will, &c. they cannot grant letters of administration; for their power is to hear and determine the appeal. (2 Bulst. 2. Roll. Abr. 233.) The archbishop hath probate of every bishop's testament, &c. though he hath not *bona notabilia* out of the diocese: so where a person dies beyond sea. (4 Inst. 335.)

The archbishop of York hath also the like court, called his *exchequer*.

COURT of *Requests*, was a court of equity, of the same nature with the court of chancery, but inferior to it; being principally instituted for the help of such petitioners, as, in conscientious cases, dealt by supplication to his majesty.

Of this court the lord privy seal was chief judge; assisted by the masters of requests. It had its beginning about 9 Hen. VII. according to sir Julius Cæsar's tract on this subject; though Mr. Gwyn says, it took its rise from a commission first granted by king Henry VIII. It was adjudged, upon solemn argument, Mich. 40 and 41 Eliz. in the court of common pleas, that this court of requests was no court that had the power of judicature, &c. And as it had assumed so great power to itself, that it grew burdensome and grievous, it was taken away, with some others, by the statute 16 and 17 Car. I. cap. 10. (4 Inst. 97.)

COURT of *Sessions*. See SESSION.

COURT of *general Quarter-Sessions of the Peace* (4 Inst. 170. 2 Hal. P. C. 42. 2 Hawk. P. C. 32.) is a court that must be held in every county, once in every quarter of a year;

year; which, by statute 2 Hen. V. c. 4, is appointed to be in the first week after Michaelmas day; the first week after the Epiphany; the first week after the close of Easter; and in the week after the translation of St. Thomas, the Martyr, or the 7th of July. It is held before two or more justices of the peace, one of whom must be of the *quorum*. The jurisdiction of this court, by statute 34 Edw. III. c. 1, extends to the trying and determining of all felonies and trespasses whatsoever; though they seldom, if ever, try any greater offence than small felonies within the benefit of clergy; their commission providing, that, if any case of difficulty arises, they shall not proceed to judgment, but in the presence of one of the justices of the courts of king's bench or common pleas, and one of the judges of assize: and, therefore, murders, and other capital felonies, are usually remitted for a more solemn trial to the assizes. They cannot also try any new-created offence, without express power given them by the statute which creates it. But there are many offences, and particular matters, which, by particular statutes, belong properly to this jurisdiction, and ought to be prosecuted in this court; as the smaller misdemeanours, against the public, or commonwealth, not amounting to felony; and especially offences relating to the game, highways, ale-houses, bastard children, the settlement and provision for the poor, vagrants, servants' wages, apprentices, and popish recusants. Some of these are proceeded upon by indictment; and others in a summary way by motion and order thereupon; which order may, for the most part, unless guarded against by particular statutes, be removed into the court of king's bench, by writ of *certiorari facias*, and be there either quashed or confirmed. The records, or rolls of the sessions, are committed to the custody of a special officer, denominated the *Custos Rotulorum*; which see. In most corporation towns there are quarter-sessions kept before justices of their own, within their respective limits; which have exactly the same authority as the general quarter-sessions of the county, except in very few instances; one of the most considerable of which is the matter of appeals from orders of removals of the poor, which, though they be from the orders of corporation-justices, must be to the sessions of the county, by statute 8 & 9 W. III. c. 30. In both corporations and counties at large, there is sometimes kept a special or petty session, by a few justices, for dispatching smaller business in the neighbourhood between the times of the general sessions; as for licensing ale-houses, passing the accounts of the parish officers, and the like.

Court of Commissioners of Sewers, a temporary tribunal erected by virtue of a commission under the great seal, formerly granted *pro re nata* at the pleasure of the crown, but now at the discretion and nomination of the lord chancellor, lord treasurer, and chief justices, pursuant to the statute 23 Hen. VIII. c. 5. Their jurisdiction is to overlook the repairs of sea-banks and sea-walls; and the cleansing of rivers, public streams, ditches, and other conduits, by which any waters are carried off: and it is confined to such county or particular district as the commission shall expressly name. The commissioners are a court of record, and may fine and imprison for contempts (1 Sid. 145.); and in the execution of their duty may proceed by jury, or upon their own view, and may take order for the removal of any annoyances, or the safeguard and conservation of the sewers within their commission. They may also assess such rates, or scots, upon the owners of lands within their district, as they shall judge necessary; and if any person refuses to pay them, the commissioner may levy the same by distress of his goods and chattels; or they may, by

statute 23 Hen. VIII. c. 5, sell his freehold lands, (and by 7 Ann. c. 10, his copyhold also,) in order to pay such rates or assessments. But their conduct is under the control of the court of king's bench, which will prevent or punish any illegal or tyrannical proceedings. Cro. Jac. 336.

COURTS, Stannary, are courts of record in Devonshire and Cornwall for the administration of justice among the tinners. They are held before the lord-warden and his substitutes, by virtue of a privilege granted to the workers in the tin-mines, to sue and be sued only in their own courts, that they may not be drawn from their business, which is highly profitable to the public, by attending their law-suits in other courts. (4 Inst. 232.) The privileges of the tinners are confirmed by a charter, 33 Edw. I., and fully expounded by a private statute, 50 Edw. III., since explained by a public act, 16 Car. I. c. 15. Whilst the tinners are employed in and about the stannaries, they shall be only impleaded in the stannary court in all matters, excepting pleas of land, life, and member. No writ of error lies from hence to any court in Westminster-hall; as was agreed by all the judges in 4 Jac. I. (4 Inst. 231.) But an appeal lies from the steward of the court to the under-warden; and from him to the lord-warden; and thence to the privy-council of the prince of Wales, as duke of Cornwall, when he hath had livery or investiture of the same. From thence the appeal lies to the king himself, in the last resort.

Court of Star-chamber, Camera Stellata, or Chambre des Estuilles, so called, because the roof was originally painted with stars; or more probably because the contracts and obligations of the Jews, before their banishment under Edw. I. which were called stars, from a corruption of the Hebrew word *shetar*, a covenant, were kept in chests in the king's exchequer. This is of an ancient standing; but its authority was very much heightened by Henry VII. and Henry VIII., who appointed, by two several statutes, (3 Hen. VII. c. 1, and 21 Hen. VIII. c. 20.) that the chancellor, assisted by others there named, should have power to hear complaints against retainers, embracers, misdemeanours of officers, and other like offences, which, through the power and authority of those who committed them, did lift up the head above other faults; and for which inferior judges were not so meet to give correction, and the common law had not sufficiently provided. The powers usurped by this court were so illegal and so oppressive, that it was finally abolished by statute 16 Car. I. c. 10, to the general joy of the whole nation.

Court of the Lord Steward, Treasurer, or Comptroller of the King's Household, (4 Inst. 133.) was instituted by statute 3 Hen. VIII. c. 14, to inquire of felony by any of the king's sworn servants, in the cheque-roll of the household, under the degree of a lord, in confederating, compassing, conspiring, and imagining the death or destruction of the king, or any lord or other of his majesty's privy-council, or the lord steward, treasurer, or comptroller of the king's house. The inquiry and trial were required to be by a jury, according to the course of the common law, consisting of 12 sad men (that is, sober and discreet persons) of the king's household.

Court of the Lord Steward of the King's Household, or (in his absence) of the treasurer, comptroller, and steward of the marshalsea, (4 Inst. 133.) was erected by statute 33 Hen. VIII. c. 12, with a jurisdiction to inquire of, hear, and determine all treasons, misprisions of treason, murders, manslughters, bloodshed, and other malicious slakings; whereby blood shall be shed in or within the limits.

C O U R T.

imits (that is, within 200 feet from the gate) of any of the palaces and houses of the king, or any other house where the royal person shall abide. The proceedings are by jury, both a grand and a petit one, as at common law, taken out of the officers and sworn servants of the king's household. The form and solemnity of the process, particularly with regard to the execution of the sentence for cutting off the hand, which is a part of the punishment for shedding blood in the king's court, are very minutely stated in the said statute 33 Hen. VIII., and the several officers of the servants of the household in and about such execution are described, from the serjeant of the wood-yard, who furnishes the chopping-block to the serjeant farrier, who brings hot irons to fear the stump.

COURT of the Lord High Steward of Great Britain, (4 Inst. 58. 2 Hawk. P. C. 5. 421.) is a court instituted for the trial of peers, indicted for treason or felony, or for misprision of either. (1 Bullr. 198.) The office of this great magistrate is very ancient; and was formerly hereditary, or, at least, held for life, or *dum bene se gesserit*: but now it is usually, and hath been for many centuries past, *pro hac vice* only; and it hath been the constant practice (and therefore seems now to have become necessary) to grant it to a lord of parliament, else he is incapable of trying such delinquent peer. (Yearb. 13 Hen. VIII. 11. Staundf. P. C. 152. 3 Inlt. 23. 4 Inst. 59. 2 Hawk. P. C. 5. Barr. 234.) When such an indictment is therefore found by a grand jury of freeholders in the king's bench, or at the assizes before the justices of oyer and terminer, it is to be removed by a writ of *certiorari* into the court of the lord high steward, which only has power to determine it. A peer may plead a pardon before the court of king's bench, and the judges have power to allow it; in order to prevent the trouble of appointing an high steward, merely for the purpose of receiving such plea. But he may not plead, in that inferior court, any other plea; as *guilty*, or *not guilty*, of the indictment; but only in this court; because, in consequence of such plea, it is possible that judgment of death might be awarded against him. The king, therefore, in case a peer be indicted for high treason, felony, or misprision, creates a lord high steward *pro hac vice* by commission under the great seal; which recites the indictment so found, and gives his grace power to receive and try it *secundum legem et consuetudinem Angliæ*. Then, when the indictment is regularly removed by writ of *certiorari*, commanding the inferior court to certify it up to him, the lord high steward directs a precept to a serjeant at arms, to summon the lords to attend and try the indicted peer. This precept was formerly issued to summon only eighteen or twenty, selected from the body of the peers; then the number came to be indefinite; and the custom was for the lord high steward to summon as many as he thought proper, (but of late years not less than twenty-three, Kelynge 56.) and that these lords only should sit upon the trial; which threw a monstrous weight of power into the hands of the crown, and this its great office, of selecting only such peers as the then predominant party should most approve of. And accordingly, when the earl of Clarendon fell into disgrace with Charles II., there was a design formed to prorogue the parliament, in order to try him by a select number of peers; it being doubted whether the whole house could be induced to fall in with the views of the court. But now, by statute 7 W. III. c. 3, upon all trials of peers for treason or misprision, all the peers who have a right to sit and vote in parliament shall be summoned, at least 20 days before such trial, to appear and vote therein; and every lord appearing shall vote in the trial of such peer, first

taking the oaths of allegiance and supremacy, and subscribing the declaration against popery.

During the session of parliament, the trial of an indicted peer is not properly in the court of the lord high steward, but before the court last mentioned, of our lord the *king in parliament*. (Fost. 141.) A lord high steward, indeed, is always appointed in that case, to regulate and add weight to the proceedings; but he is rather in the nature of a speaker *pro tempore*, or chairman of the court, than the judge of it; for the collective body of the peers are therein the judges both of law and fact, and the high steward has a vote with the rest, in right of his peerage. But in the court of the lord high steward, which is held in the recess of parliament, he is the sole judge of matters of law, as the lords triers in matters of fact; and as they may not interfere with him in regulating the proceedings of the court, so he has no right to intermix with them in giving any vote upon the trial: consequently, it hath been holden by the judges (Fost. 139.) that in case the day appointed in the judgment should lapse before execution done, a new time of execution may be appointed by either the high court of parliament, during its sitting, though no high steward be existing; or, in the recess of parliament, by the court of king's bench, the record being removed into that court. For the right of bishops to sit in the court of the lord high steward on trial of indictments of treason, &c. See BISHOP.

COURT, Supreme. See **COURT of Peers**, and **PEER**.

COURT of Sheriff's Tourn, or rotation, is a court of record, held twice every year, within a month after Easter and Michaelmas, before the sheriff, in different parts of the county; being, indeed, only the turn of the sheriff to keep a court-leet for each respective hundred. This, therefore, is the great **COURT-leet** of the county, as the **COUNTY-court** is the **COURT-baron**.

COURT of the Verge. See **COURT of the Marshal'sea**, &c.

COURT, University. The courts of the universities of Oxford and Cambridge are of a particular nature: they were granted by charters, and confirmed by authority of parliament; and they are called the chancellor's courts.

The two universities enjoy the sole jurisdiction, in exclusion of the king's courts, over all civil actions and suits whatsoever, when a scholar or privileged person is one of the parties, excepting in cases where the right of freehold is concerned. And these, by the university charter, they are at liberty to try and determine, either according to the common law of the land, or according to their own local customs, at their discretion; which has generally led them to carry on their process in a course much conformed to the civil law. The jurisdiction of their criminal courts is equally extensive with that which concerns the redress of their civil injuries. They have authority to determine all criminal offences or misdemeanors, under the degree of treason, felony, or mayhem: but whilst the prohibition of meddling with freehold still continues, the trial of treason, felony, and mayhem, is committed to the university jurisdiction in another court, namely, the court of the *lord high steward* of the university. For by the charter of 7 Jun. 2 Henry IV. (confirmed by the statute 13 Edw. c. 29.) cognizance is granted to the university of Oxford of all indictments of treasons, insurrections, felony, and mayhem, which shall be found in any of the king's courts against a scholar or privileged person; and they are to be tried before the high steward of the university, or his deputy, who is to be nominated by the chancellor of the university for the time being. But, when his office is called forth into action, such high steward

Steward must be approved by the lord high chancellor of England; and a special commission under the great seal is given to him, and others, to try the indictment then depending. according to the law of the land and the privileges of the said university. When, therefore, an indictment is found at the assizes, or elsewhere, against any scholar of the university, or other privileged person, the vice-chancellor may claim the cognizance of it; and (when claimed in due time and manner) it ought to be allowed him by the judges of assize; and then it comes to be tried in the high steward's court: but the indictment must first be found by a grand jury, and then the cognizance claimed. When the cognizance is allowed, if the offence be only a misdemeanour, it is tried in the chancellor's court by the ordinary judge. But if it be treason, felony, or mayhem, it is then, and then only, to be determined before the high steward, under the king's special commission to try the same. The process of the trial is this. The high steward issues one precept to the sheriff of the county, who thereupon returns a panel of eighteen freeholders; and another precept to the bedells of the university, who thereupon return a panel of eighteen matriculated laymen; and by a jury formed *de medietate*, half of freeholders and half of matriculated persons, is the indictment to be tried; and that in the Guildhall of the city of Oxford. And if execution be necessary to be awarded, in consequence of finding the party guilty, the sheriff of the county must execute the university process; to which he is annually bound by an oath. Many instances occur, one in the reign of queen Elizabeth, two in that of James I., and two in that of Charles I., where indictments for murder have been challenged by the vice-chancellor at the assizes, and afterwards tried before the high steward by jury. The commissions under the great seal, the sheriff's and bedell's panels, and all the other proceedings on the trials of the several indictments, are still extant in the archives of the university.

These privileges to the universities were granted, that the students might not be distracted from their studies by legal process from distant courts, and other forensic avocations. These privileges are of very high antiquity, both in foreign universities as well as our own. The oldest charter which judge Blackstone has seen, containing this grant to the university of Oxford, was 28 Hen. III., A. D. 1244; and the same privileges were confirmed and enlarged by almost every succeeding prince, down to king Henry VIII., in the 17th year of whose reign the most extensive charter of all was granted. A similar one to this was afterwards granted to Cambridge, in the third year of queen Elizabeth. In the reign of queen Elizabeth an act of parliament was obtained, (13 Eliz. c. 29.) confirming all the charters of the two universities, and those of 14 Henry VIII. and 3 Eliz. by name. This act of Elizabeth is called by sir Edward Coke a "blessed act;" and sir Matthew Hale very fully expresses the sense of the common law and the operation of the act of parliament. (4 Inst. 227. Hale's Hist. c. 4. 33.)

This privilege, so far as relates to civil causes, is exercised at Oxford in the chancellor's court, the judge of which is the vice-chancellor, his deputy, or assessor. From his sentence an appeal lies to delegates, appointed by the congregation; from thence to other delegates of the house of convocation; and if they all three concur in the same sentence, it is final, at least by the statutes of the university, according to the rule of the civil law. But if there be any discordance in any of the three sentences, an appeal lies in the last resort to judges delegates appointed by the crown, under the great seal in chancery.

COURTS of Wales, are established over the principality chiefly by 12 Edw. I. and 34 and 35 Hen. VIII. c. 26. Besides courts baron, hundred and county courts, like those in England, a session is held twice every year in each county, by judges appointed by the king, (stat 18 Eliz. c. 8.) to be called the great sessions of the several counties in Wales; in which all pleas of real and personal actions shall be held in the same manner, and with the same extent, as in the court of common pleas at Westminster; and writs of error shall lie from judgment in this (being a court of record) to the court of king's bench. And the proceedings are according to the laws of England.

For the regulation of the practice of these courts in Wales, see stat. 5 Eliz. c. 25. 8 Eliz. c. 20. 8 Geo. I. c. 25. § 6. 6 Geo. II. c. 14. 13 Geo. III. c. 51. But the ordinary original writs or process of the king's courts at Westminster do not run into the principality of Wales (2 Roll. Rep. 141.); though process of execution does (2 Bulstr. 156. 2 Saund. 193. Raym. 206.); as do also all prerogative writs, as writs of *certiorari*, *quo minus*, *mandamus*, and the like (Cro. Jac. 484.) And even in causes between subject and subject, to prevent injustice, through family factions or prejudices, it is held lawful (in causes of freehold at least, and it is usual in all others) to bring an action in the English courts, and try the same in the next English county adjoining to that part of Wales where the cause arises (Vaugh. 413. Hardr. 66.), and wherein the venue is laid. But, on the other hand, to prevent trifling and vexatious suits, it is enacted by statute 13 Geo. III. c. 51. that in *personal* actions, tried in any English county, where the cause of action arose, and the defendant resides in Wales, if the plaintiff shall not recover a verdict for ten pounds, he shall be non-sued and pay the defendant's costs, unless it be certified by the judge that the freehold or title came principally in question, or that the cause was proper to be tried in such English county. And if any *transitory* action, the cause whereof arose and the defendant is resident in Wales, shall be brought in any English county, and the plaintiff shall not recover a verdict for ten pounds, the plaintiff shall be non-sued, and shall pay the defendant's costs, deducting from it the sum recovered by the verdict.

COURT of Wards, a court first erected by king Hen. VIII. (stat. 32 Hen. VIII. c. 46.) and after augmented by him with the office of *liveries*: but now absolutely taken away and abolished, by a statute made 12 Car. II. cap. 24. together with the oppressive tenures upon which it was founded. See *INQUEST of Office*.

COURT, *Bouche of*. See *BOUCHE*.

COURT, *Despight of the*. See *DEPARTURE*.

COURT, *Forejudged the*. See *FOREJUDGED*.

COURT, *Inns of*. See *INN*.

COURT, *Perquisites of*. See *PERQUISITE*.

COURT, *Suit of*. See *SUIT*.

COURT, *Ambulatory*. See *AMBULATORY*.

COURT, *Base*. See *BASE*.

COURT, *Honour*. See *HONOUR*.

COURT, *Lawless*. See *LAWLESS*.

COURT, *Wood-plea*. See *WOOD*.

COURT of Aldermen, in *Geography*, a cluster of small islands or rocks, near the east coast of New Zealand, in the Southern Pacific Ocean, about half a league in extent every way, and five leagues from the main land. S. lat. 36° 57'.

COURT-Days, are days when the courts of judicature are open and pleas held.

COURT-Lands, called *curtils terra*, such as the lord of the manor

manor keeps in his own hands, for the use of his family, and for hospitality. See MANOR.

COURT-ROLL, a roll which contains an account of the number, &c. of lands depending on the lord of the manor; with the names of the tenants, &c.

Tenants holding by copy of this roll, are denominated *copy-holders*; which see.

COURTAIN. See CURTIN.

COURTANVEAUX, in *Geography*, a town of France, in the department of the Loir and Cher; 12 miles W. of Verdes.

COURTELARY, a small town of France in the department of the upper Rhine with 514 inhabitants. The canton of which it is the chief place has an extent of 120 kilometres, thirteen communes, and a population of 7202 individuals.

COURTENAY, in Latin *Curtiniacum*, a small town of France in the department of Loiret, chief place of a canton in the district of Montargis, on the river Clairi, 100 miles S. of Paris, with 2485 inhabitants. The population of the canton amounts to 7487; its extent is of 242 kilometres and a half, and it has fifteen communes.

COURTERON, a town of France, in the department of the Aube; 2 leagues S. of Bar-sur-Seine.

COURTESY, or *CURTESY of England, tenant by, in Law*. See TENANT.

COURTESY, arms of. See ARMS.

COURTINE, a small town of France in the department of the Creuse, chief place of a canton in the district of Aubusson. It contains 558 inhabitants. The canton comprizes eleven communes, and counts 5712 individuals on a territory of 327 kilometres and a half.

COURTISAN, or *COURTEZAN*, a term of infamy, applied to women who expose their persons, and make a trade of prostitution.

Lais, the famous Theban courtesan, stands on record for requiring no less than ten thousand crowns for a single night. Of all places in the world, Venice is that where courtesans abound the most; it is more than three centuries, since the senate, which had expelled them, was obliged to recall them; to provide for the security of women of honour, and to keep the nobles employed, lest they should make innovations in the state.

COURTLARS, in *Geography*, a town of Switzerland, in the territory of Bienne; 7 miles N.W. of Bienne.

COURTMACSHERRY BAY, on the south east coast of the county of Cork, Ireland, lying between the Old-head of Kinfale, and the Seven heads. The outer bay is sufficiently deep, but there is little or no shelter in it. In the inner harbour vessels may lie very safe, but there is a bar, which makes it accessible only to small vessels. N. lat. 51° 36'. W. long. 8° 40' from Greenwich.

COURTNEY, WILLIAM, in *Biography*, fourth son of Hugh earl of Devonshire, by Margaret, grand daughter of king Edward I. was born about the year 1341. He was educated at Oxford, where he applied himself with much diligence to his studies, and resolved upon the clerical life. His great family interest opened for him the road to the highest preferment in the church. At twenty-eight years of age he was promoted to the bishopric of Hereford, whence in about five years he was translated to the see of London. In 1376 he distinguished himself by an undaunted opposition to the king's demand of a subsidy, unless he would promise a redress of the injuries sustained by himself and William Wickham, bishop of Winchester. Shortly after this, the pope having excommunicated the Florentines, di-

rected his bull to be sent to all parts, in which orders were given for the seizure of their property. That bull, the bishop, without consent of the king, published at Paul's Cross, and at the same time, most unwarrantably gave a licence to the populace to plunder the houses of such Florentines as resided in the city of London. For this high offence against the peace of the realm, and the dignity of the sovereign, he was censured and obliged to submit. In 1377, he cited, on the authority of the pope's mandate, the celebrated Wickliffe to appear before his tribunal at St. Pauls, where he behaved with indecent arrogance, and would have inflicted on that great man cruel severities, had he not been supported by persons of the first rank and power in the country. In 1381 this bishop was raised to the highest office in the state, viz. that of lord chancellor of England, and in the same year he was translated to the archbishopric of Canterbury; he now had opportunity fully to display the temper and spirit which had before been but too well known. He excommunicated one man for a slight offence, and refused him absolution unless he submitted to be beaten with a cudgel, naked in the market places of West Malling, Maidstone and Canterbury. He excited a bitter persecution against the adherents to the doctrines of Wickliffe. Notwithstanding the violence and rancour of his temper, he was constituted the first of eleven commissioners, to whom was entrusted the direction of government for a year to make what reformation they thought fit. Into the hands of very few could power have been entrusted with less safety; he met, however, with some salutary checks to the strides which he was making to an arbitrary exhibition of his authority. He died at Maidstone in 1396; regretted by few of those whose good-will he was bound to cherish. As an instance of firmness and self-possession which archbishop Courtney was always supposed to enjoy, the following anecdote has been mentioned by his biographers. The archbishop and others being assembled with a view of condemning the tenets of Wickliffe; they had scarcely taken their seats when a violent earthquake shook the house. They all determined to proceed no farther, concluding that the business was displeasing to the Almighty; the archbishop remained unmoved; he rallied them for their fears, and said if the earthquake portended any thing, it must be the downfall of heresy; that as noxious vapours are lodged in the earth, and are expelled by violent concussions, so by their strenuous endeavours, the kingdom should be purified from the taint of heresy, which had infected it in every part. Biog. Britan.

COURTOMER, in *Geography*, a small town of France, in the department of Orne, in the district of Alençon, 6 miles E. of Séz. It is the chief place of a canton and has 806 inhabitants. The canton itself has a population of 7811 individuals, twenty communes, and a territorial extent of 170 kilometres.

COURTONNE, LA VELLE, a town of France, in the department of the Calvados, and district of Lisieux, 2½ leagues S.E. of Lisieux.

COURTRAY, in Latin *Corturiacum*, an ancient town of France in the department of the Lys, which was formerly a part of Aulrian Flanders. It is the chief place of a district of the same name, which, upon a territorial extent of 832 kilometres and a half, and in 67 communes, contains a population of 164,375 individuals. Its canton has 23 communes with 52,952 inhabitants, and a territorial extent of 280 kilometres. Courtray itself has a population of 13,674 individuals, not, (as the chevalier de Tirseau states) 11,674, which is evidently an error of the press. It is situated

situated on the river Lys, 12 miles N.E. of Lille, 15 N.W. of Tournay, and 183 N. of Paris, E. long. 3°. 10'. N. lat. 51° 50'. The old Flemish name was Cortryek.

The celebrated linen manufactures of Courtray had their rise about the year 1268. They still form the principal trade of the place, which has a sub-prefect, an inferior court of justice, and a register.

The soil of the district of Courtray is uncommonly fertile. It produces the finest and strongest flax in Europe. The inhabitants excel in the cultivating, dressing and spinning of this valuable vegetable. There are also some sugar and soap houses, starch manufactories, breweries, and a manufacture of earthenware, which is said to approach the perfection of the English earthenware.

COURVILLE, a small town of France in the department of Eure and Loire, on the river Eure, 9 miles W. of Chartres. It is the chief place of a canton in the district of Chartres, and has 1,381 inhabitants. The canton itself has a population of 9,462 individuals, sixteen communes, and an extent of 262 kilometres and a half.

COURAPITA, in *Botany*, Lam. Enc. Juss. 326. Aubl. Guian. 708. tab. 282. (Pekoa; Pis. Bras. 141? Couroupitoutoumu; Bar. Fr. Equinox. 92.) A large tree often more than two feet in diameter, with a thick, cracked, rugged bark. *Branches* from the summit of the trunk. *Leaves* a foot long, four inches broad, alternate, oval-oblong, acute, entire, smooth, even-surfaced, petioled. *Flowers* in lateral simple erect racemes, large, rose-coloured, sweet-scented, with a caducous bract at the base of each pedicel, and two others under the calyx. All the parts of fructification are exactly similar to those of *Leceythis* Linn. (see that article), except the capsule, which is round, woody, brown and rugged; crowned with the remains of the calyx, and with a kind of operculum which does not separate; enclosing under a fibrous pulp another globular, thin, brittle, six-celled capsule, with membranous partitions which disappear as the fruit ripens; and containing numerous seeds bedded in pulp. A native of Guiana. The Creoles and the Negroes call the fruit cannon balls, which they much resemble, and are in size equal to a thirty-six pounder. The pulp between the capsules may be extracted through a hole made for the purpose, and then the inner capsule will move freely within the other. The pulp of the latter has an acid, not unpleasant, taste.

COUS, in *Ancient Geography*, a city of Egypt, situated to the east of the Nile, formerly the city of Apollo. In consequence of the conveyance of Indian commodities from the Red Sea to the Nile, by the shortest route, *viz.* from Cosseir, probably the Philoterus Portus of Ptolemy, to Cous, a journey of four days, Cous, from a small village, became the city in Upper Egypt next in magnitude to Fostat or Old Cairo. This town, which, like Coptos, was indebted for its importance to the trade with India, possessed great opulence during the dominion of the Arabs. Since the Turks have become masters of Egypt, and this beautiful country has been laid waste by a pacha and 24 beys, Cous has undergone the fate of her rival. The trade from the Red Sea by Cosseir is removed to Giené or Kené, farther down the river than Cous; and the latter place is reduced to a collection of cottages, inhabited by a few Copts and Arabs. In modern times, all the commodities of India, imported into Egypt, are either brought by sea from Gidda to Suez, and thence carried on camels to Cairo; or are conveyed by land-carriage, by the caravan returning from the pilgrimage to Mecca.

COUSANGE, in *Geography*, a small town of France,

in the department of the Jura, chief place of a canton, in the district of Lons Le Saulnier, with 1152 inhabitants. The canton itself has 24 communes, a territorial extent of 130 kilometres, and a population of 11,850 individuals. There are in this canton quarries of beautiful grey marble spotted red.

COUSEL, a small town of France, in the department of Sarre. It is the chief place of a canton, in the district of Birkenfeld, and has 1269 inhabitants. The canton itself comprises 43 communes and 8519 inhabitants.

COUSERANS, or CONSERANS, a small territory of France, in what was formerly called the province of Gascony, the lord of which was a viscount. It now forms part of the department of Arriège.

COUSIN, a term of relation and kinship; applied to those who are issued from two brothers or two sisters.

The word is ordinarily derived from *consanguineus*; though Menage brings it from *congenius*, or *congenicus*, q. d. *ex eodem genere*.

In the first generation they are called *cousin germans*, i. e. next cousins; in the second, *second cousins*; in the third and fourth, *cousins in the third and fourth degrees*.

In the primitive times, it was allowed *cousin germans* to marry, to prevent their making alliances in heathen families; but Theodosius the Great prohibited it, under pain of death; on pretence that they were, in some sort, brothers and sisters, with regard to each other.

Paternal cousins, are those sprung from relations on the father's side. *Maternal*, those on the mother's.

COUSINS, *Quater*. See QUATER.

COUSIN is also a title of honour, which kings bestow on peers, or nobles, foreign princes of the blood, cardinals, and the principal persons of their state.

COUSIN, JEAN, in *Biography*, a French painter of the 16th century. He was a native of Soucy, near Sens; but the year of his birth is not known. We learn, however, that he married the daughter of the lieutenant-governor of Sens in 1589. He resided principally at Paris, and painted with increasing reputation in the successive reigns of Henry II., Francis II., Charles IX., and Henry III., who feverally accorded him marks of their favour. We are not told if he had a master; but it is probable that he improved himself from the studies he made on the works of Primaticcio at Fontainebleau.

Cousin is considered as the earliest historical painter of any note which France has produced. It is to be regretted, that many of his finest compositions were painted upon glass: there exist, however, some of his productions on canvas, which evince an elevated conception and considerable powers of execution. His heads are expressive, and the tout-ensemble of his pictures striking and agreeable; though not wholly devoid of a dryness of manner. The Last Judgment, in a church at Vincennes, is his most celebrated performance. The paintings on the windows in the church of St. Gervais at Paris, representing the Martyrdom of St. Lawrence, the Story of the Samaritan Woman, and another sacred subject, are likewise the works of this artist. Nor was his genius confined to the pallet: the monument of admiral Chabot, in the church of the Celestines at Paris, shews him to have been no contemptible sculptor. The year of his death is unknown; but we learn that he lived to an advanced age. Felibien, *Extrait des differens Ouvrages, &c.*

COUSINET, CATHARINE ELIZABETH, an engraver, born at Paris in 1726. This lady received instructions from Cars and Fessard, and was afterwards married to Louis

Lempereur, which connection strengthened her natural bias for the graver. Madame Couffinet has engraved many plates in a very neat style; and, amongst others, "La Pyramide de Sextius," from Pannini; "Les trois Colonnes de Campo Vaccino," do; "Depart de la Chaloupe, & L'heureux Passage," a pair from Vernet. Huber, Heinecken, Strutt.

COUSSAPOA, in *Botany*, Lam. Enc. Aubl. Guian. 955. Frustrification not perfectly known.

Sp. 1. *C. latifolia*. Aubl. tab. 361. "Leaves oval; peduncles branched." A tree seventy feet high, and three in diameter, branched near the top. *Leaves* about five inches long and three broad, alternate, oval, entire, firm, with prominent nerves, even-surfaced, green above, reddish underneath, petioled; stipules long, solitary, caducous. *Flowers* collected in spherical heads, on common peduncles, which form a kind of corymb. *Fruit* yellowish, consisting of numerous small seeds, attached to a spherical pulpy receptacle. 2. *C. angustifolia*. Aubl. tab. 363. "Leaves ovate-oblong; peduncles simple." *Leaves* three inches long, and near two broad, with fewer nerves than in the other species. *Fruit* larger, solitary, or growing in pairs, each on a distinct simple peduncle. Both the species are natives of Guiana.

COUSSARÉA, Lam. Enc. Jussieu. 203. Aubl. Guian. 98. tab. 38. Class and order, *tetrandria monogynia*. Nat. O. d. *Rubiaceae*. Juss.

Gen. Ch. *Cal.* Perianth five-toothed. *Cor.* monopetalous; tube short; border with four lanceolate divisions. *Stam.* Filaments four, attached to the upper part of the tube between the divisions of the border; anthers oblong. *Pyl.* Germ inferior, roundish, crowned by a disk; style in the centre of the disk; stigma four or five-cleft. *Peric.* Berry egg-shaped, umbilicated, violet-coloured, one-celled. *Seed* solitary, roundish, coriaceous.

Sp. *C. violacea*. A shrub seven or eight feet high, with a stem about three inches in diameter; branches and branchlets opposite. *Leaves* decussated, large, oval, acuminate, entire, smooth, thinning, on short petioles; stipules oval-acute, opposite, intermediate. *Flowers* white, in small terminal, almost sessile clusters. The pulp of the berries is yellow, and adheres to a shell which contains the seed. A native of Guiana.

COUSSAY, in *Geography*, a town of France, in the department of the Vienne, and district of Loudun; $3\frac{1}{2}$ leagues S. of Loudun.

COUSSERGUES, a town of France, in the department of Aveyron; 20 miles S.E. of Rhodéz or Rodes.

COUSSEY, a small town of France, in the department of the Vosges, in the district of Neufchâteau, 3 miles from that city. It has only 644 inhabitants; and the canton, of which it is the chief place, contains 26 communes, and a population of 7539 individuals, upon a territorial extent of 201 kilometres and a half.

COUSSIN, H., in *Biography*, an engraver. We know nothing more of this artist than that, about the year 1760, he engraved some plates at Aix in Provence, and at Lyons, from Puget, Rembrandt, and some other masters. Strutt, Heinecken.

COUSSINET, CUSHION, in *Architecture*, the stone that crowns a piedroit, or pier; or that lies immediately over the capital of the impost. Its under-side is level, and its upper curved; receiving the first rise or spring of the arch, or vault.

The word is used also to signify an ornament, in the Ionic capital, between the abacus and echinus, or quarter-round;

and which serves to form the volutes. It is thus denominated from its representing a pillow, or cushion, pressed by the weight over it, and bound with the strap, or girdle, called, by Vitruvius, *balticus*.

COUSSINET, *Fr.* a bag. Formerly a French soldier wore a sort of bag on his left side, beneath the cross belt, where the butt of the musquet comes when carried. There were hooks for hanging it to. This term signifies also a wedge made use of for supporting a mortar on its bed.

COUSSON, in *Geography*, a river of France, which runs into the Loire, near Bois.

COUSTILLE, an offensive arm, which some soldiers made use of in the 15th century, and towards the time of Charles VII., longer than an ordinary sword, and cutting from the guard to the point, very thin, and of three faces or edges. A long poignard.

COUSTILLER, a person so called, from being armed with a coustille, or long poignard. The coustiller was the valet, who accompanied a cavalier or homme d'armes, independent of the page.

COUSTOU, NICOLAS, in *Biography*, a sculptor, born at Lyons in 1658. He received the rudiments of the art from his uncle, Antoine Coyzevox, who sent him to Rome, and placed him under the tuition of the cavalier Bernini. Under this master he made such rapid progress in the art, that on his return to France he was esteemed one of the best sculptors in that kingdom. Coustou established himself at Paris, where his increasing reputation soon procured him the countenance of Louis XIV., who granted him a pension, and conferred upon him many other marks of the royal favour. In 1702 he was made professor of the royal academy at Paris; and, after executing many works with undiminished success, he died in that city at the age of 71.

Most of the statues which decorate the church of the invalids at Paris are from the chisel of Coustou. There are also three statues by this artist, from which Cochin has made engravings. They are, 1. "Le Chasseur qui se repose;" 2. "Une Nympe de Chasse;" and, 3. "La Chasse à l'Oiseau." Abeced. Pittor. Heinecken.

COUSTOU, GUILLAUME, born at Lyons in 1677, was brother to the preceding artist, and having, like him, been some time instructed by Antoine Coyzevox, at a proper age, was sent to Rome, where he made such progress in sculpture that he promised to equal his brother Nicolas. Returning to France, he went to Paris, where he chiselled many fine statues for Louis XIV. and many of the French nobility. After the death of Louis, he continued to enjoy the favour of the duke of Orleans, regent of France. He became member, and afterwards director, of the royal academy of sciences at Paris; which office he continued to enjoy until his death, which happened in the year 1746. Abeced. Pittor. Heinecken.

COUSU, in *Heraldry*, has the same signification as *Rempli*, viz for a piece of another colour or metal placed on an ordinary, as if it were sewed on; which the word, in the French language, naturally implies; because the additional piece is not properly on the field, but in the nature of a thing sewed on. This is generally colour on colour, or metal on metal, contrary to the general rule of heraldry.

COUTABOU, in *Geography*, a town of Asia, in the country of Thibet; 25 miles E. of Manas-Hotun.

COUTARDE, in *Botany*, Aubl. See HYDROLEA *spinosa*.

COUTANCES, in Latin *Constantia*, in *Geography*, an ancient

ancient town of France, in the department of La Manche, situated between the small rivers Soulle and Bulfare, partly on a hill and partly in a plain, about 200 miles W. of Paris, 48 N.E. of St. Malo, 36 W. of Caen, and 27 N. of Avranches; in W. long. $1^{\circ} 32'$, and N. lat. $49^{\circ} 2' 50''$; not far from the sea. It has a sub-prefect, a bishop, three courts of justice, and a register office. From the remains of an aqueduct, supposed to be Roman, Coutances is conjectured to be a place of great antiquity. It was formerly the capital of the Cotentin in Lower Normandy. Its population amounts to 8507, and that of its canton, which contains 8 communes and a territorial extent of 57 kilometres and a half, to 14,847 individuals.

Coutances is the chief place of a district, which, upon a territorial extent of 1570 kilometres, counts 139 communes and 130,530 inhabitants. This district produces abundance of corn, pulse, and garden fruits: its pastures are excellent. It is famous for capital Normandy horses and good milking cows. There are also much cotton and worsted yarn, linen, and ticking, and parchment, manufactured in this district; the principal trade is with corn, butter, poultry, horses, cattle, worsted, lace, and parchment.

COUTAREA, in *Botany*, Aubl. See *PORTLANDIA hexandra*.

COU-TCHENG, in *Geography*, a town of Asia, in the country of Corea; 37 miles S.W. of Tsin-tcheou.

COU-TCHING, a town of China, of the third rank, in the province of Pe-tche-li; 6 leagues S.S.W. of King.—Also, a town of Asia, in the country of Corea; 22 miles S.S.E. of Ko-ang-tcheou.

COU-TCHING-KEON, a small Chinese island. N. lat. $35^{\circ} 55'$. E. long. $122^{\circ} 14'$.

COUTEAUX, DES, a lake of Upper Canada, running about S.W. by W. 12 miles, and from a quarter to two miles wide, from which is a portage of 65 paces. A deep bay runs E. three miles from the west end, where it is discharged by a rapid river; and after running two miles W., it again becomes still water. In this river are two carrying places, the one 15, and the other 190 paces. From this to the portage des Carpes is one mile N.W., leaving a narrow lake on the E. that is parallel with the lake des Couteaux, half its length, where is a carrying place, which is used when the water in the last-mentioned river is too low. The portage des Carpes is 390 paces, from whence the water spreads irregularly between rocks, five miles N.W. and S.E. to the portage of Lac Bois Blanc, which is 180 paces. Then follows the lake of that name, improperly called, says Mr. Mackenzie, as the natives name it the "Lake Pascow Minae Sagan," or Dry Berries.

COUTHUPLAUGH, from the Saxon *couth* knowing, and *utlaugh*, *outlaw*; a person who receives a man outlawed, and cherishes or conceals him: for which offence he was, in ancient time, subject to the same punishment with the outlaw himself. Braët. l. 3. tr. 12. c. 3.

COU-TIAN, in *Geography*, a town of China, of the third rank, in the province of Fo-kien; 32 miles S.S.E. of Kien-nhing.

COUTOUBEA, in *Botany*, Aubl. See *EXACUM spicatum ramosum*.

Obf. We shall here observe, once for all, that many of Aublet's genera not having yet received classic names, we have reluctantly preserved his barbarous nomenclature. This, indeed, has already been done by La Marck and Jusliu; but the latter professedly regards it only as a temporary distinction. "Quædam," says he, "forte ulteriori recognitione delenda & addenda confinibus; unde, rudia hæc, nondum mutantur horum nomina."

COUTOUEYOU-HOTUN, in *Geography*, a town of

Chinese Tartary; 215 miles E. of Pekin. N. lat. $45^{\circ} 8'$. E. long. $113^{\circ} 23'$.

COUTRA, a lough or lake of Ireland, in the county of Galway, near the borders of Clare, which is said to possess all the beauties that hills, woods, and islands can impart to water. It is about 3 miles S.E. from Gort. Beaufort.

COUTRAS, a small town of France, on the river Drome, in the department of Gironde, 12 miles N.E. of Libourne, and about 400 S.W. of Paris; in N. lat. $46^{\circ} 4'$. It is the chief place of a canton, and has 3060 inhabitants. The canton itself has an extent of 197 kilometres and a half, 13 communes, and a population of 9637 individuals. Coutras is remarkable for a victory which Henry IV. of France gained here, in 1587, over the army of the League.

COUTURE D'ARGENSON, a town of France, in the department of the Two Sevres, and district of Meile; 8 leagues S.E. of Niort.

COUIRE, La, a town of France, in the department of the Straits of Calais, and district of Bethune; $1\frac{1}{2}$ league N.E. of Bethune.

COUVAY, JOHN, in *Biography*, a designer and engraver, born at Arles about the year 1622. This artist may be ranked as a good second-rate engraver. He managed his graver with facility and boldness, in a style much resembling that of Villemena. He has engraved both historical pieces and portraits, as well from his own compositions as from those of Raffaele, Guido, Annibale Caracci, and other painters, and frequently marked his plates with a cypher, composed of the initials of his name. Amongst his best prints we may enumerate the following: 1. "Louis XIV. a cheval, précédé de la Renommée," from J. Bourdon; 2. "La Vierge Marie, qui présente des Œilletts a l'Enfant Jesus, assis sur ses Genoux," from Raffaele; 3. "St. Jean-Baptiste dans le Desert," from the same; 4. "St. Benoit tenté par le Demon de la Chair, le fait fuir en lui montrant le Crucifix," from Guercino. The time of Couvay's death is not known. Huber, Strutt, Heineken.

COUVERCLE, in *Geography*, an eminence in the glaciers of Chamouny in Switzerland, which consists of a most extraordinary rock of granite, having the appearance of a large, irregular, multilateral building placed on a mountain; the ascent to which along the ice is very laborious, but perfectly secure. Near the base of this elevated rock three stupendous vallies of ice present themselves to view; viz. the glaciers of Talefre to the left, in front that of P'Échant, and the Tacu to the right; all uniting in one great valley of ice, called the "Glacier des Bois," which stretch under the feet of the observers, and appear surrounded and ornamented by the rugged needles. From the top of this eminence the view comprehends the same sublime scenes observed at its base; but considerably heightened and enlarged;—the stupendous extent of ice appearing like a rugged expanse of frozen sea, bounded by the most gigantic rocks, and terminated by Mont Blanc, the Atlas of the globe. In this situation, the eyes of the spectator, himself entirely enclosed between ice and snow, repose on a triangular rock, clothed with grass and Alpine plants, and darting up like a fertile island in the midst of a desolate ocean. This is known by the name of the "Garden," and exhibits a curious contrast to the surrounding dreariness.

COUVERT, in *Heraldry*, denotes something like a piece of hanging falling over the top of a chiert, or other ordinary, so as not to hide but only to be a shadow to it.

COUVERT, Fr., a *Shelter*, or *Cover*, in *Military Language*, a term expressive of safety, protection, or security. To advance under cover of the guns, is to advance against an enemy, who dares not approach you on account of the

fire from your guns, whether they be on board of vessels, or on works, or batteries. It also signifies whatever shelters any movement, or renders it imperceptible; as under cover of the night, under cover of a wood, dyke, town, eminence, &c. A work defended by another work is covered. The corridor, or great road of the rounds, is covered by the glacis, which serves as a parapet to it. A camp is said to be covered by a river, by a morass, by a wood, by a hill, &c. A gate of a place is in like manner said to be covered by a ravelin.

COUVERT, or COVERT, in *Rural Economy*, a word frequently applied to a place that is sheltered, not open or exposed, as from brushwood, &c.

COUVERTURE *d'un Camp, d'un Logement*. See COUVERT.

COUVEY, or COVEY, in *Rural Economy*, a term often provincially applied to a cover of furze or other low shrubby plants, kept for the preservation of game. It also signifies a flock of partridges.

COUVIGNAN, in *Geography*, a town of France, in the department of the Aube, and district of Bar-Sur-Aube; 1 league W.S.W. from Bar-Sur-Aube.

COUVIN, a small town of France, chief place of a canton, in the department of the Ardennes, district of Rocroy. Its population amounts to 2496, and that of the canton to 9004 individuals. The canton has 15 communes, and a territorial extent of 220 kilometres.

COUVIN, a town of Germany, in the circle of Westphalia, and bishopric of Liege; 15 miles S.S.W. of Liege.

COUVRE-FACE, Fr. Cover-face. This term is used by some engineers, and among others by Cohorn, to denote or express the counter-guard. Others, and particularly Montalembert, mean by *couvre face general*, or general cover-face, a complete second line of investment.

COUVRE-Feu. See CURFEU.

COUXEA, in *Geography*, a town of Africa, on the coast of Upper Guinea; in the country of Sierra Leona. N. lat. 7° 30'. W. long. 9° 24'.

COW, or COW-MULL, a river of Hindoostan, formed by the junction of the Dilen, which rises to the N. or N.W. of Ghizni, and of the Semil, which falls into the Dilen, near Gurdaiz. The confluent river, after this junction, takes the name of Cow, and, pursuing its course towards Nagar, or Nughz, receives near that place another river, which flows from the quarter of Candahar. Major Renne'l concludes, on the best authority, that the waters of Ghizni and Gurdaiz form the great river of Bungush, which passes by Nughz, and Bunnoo, and discharges itself into the Indus at Deenkote; and also that this river is the one named Cow, or Cow-mull, by the oriental historians and geographers. This river Rennel proves to have been the ancient *Cobhenes*; which see.

Cow, in *Rural Economy*, an animal of the neat cattle kind, which is well known as supplying milk, one of the principal articles of food for man. Of this useful creature there are several different breeds and varieties, which differ materially in their habits and economy, so as to suit the different views and purposes of the farmer. Some of the breeds are remarkable for their docility and tameness, while others possess a considerable degree of wildness and ferocity. It is obvious, that in providing cow-flock, much attention is requisite, in order to suit the animals to the different intentions which they are to supply, as well as the pasture on which they are to be fed. Where milk is the primary object, they should be carefully selected from such cows as have been found to afford, not only good milk in a large proportion to their size, but continued it for a considerable length of time. In the view of cheese, quantity

of milk must be chiefly attended to; but in the case of butter, the quality of the milk will be more necessary to be regarded than the quantity. Where the intention is breeding, form and breed will require the particular consideration of the farmer.

In all cases, it will also be proper that the male should be of a proper age, in order to his possessing due vigour, and be in good keep.

There is likewise much care and attention demanded in the rearing of the young flock in all these views. See CALF.

The principal distinguishing marks of a good cow are said to be these: wide horns, a thin head and neck, dewlap large, full breast, broad back; large deep belly; the udder capacious, but not too fleshy; the milk veins prominent, and the bag tending far behind; teats long and large; buttocks broad and fleshy; tail long and pliable, legs proportionable to the size of the carcase; and the joints short. To these outward marks may be added a gentle disposition, a temper free from any vicious tricks, and perfectly manageable on every occasion. On the other hand, a cow with a thick head and short neck, prominent back bone, slender chest, belly tucked up, small udder, or a fleshy bag, short teats, and thin buttocks, is to be avoided, as totally unfit for the purposes either of the dairyman, the suckler, or the grazier.

There are different kinds of these animals preferred in different situations and sorts of land. The most valuable cows are perhaps, however, those which are bred in Lancashire, Yorkshire, Staffordshire, and upon the strong land in other parts of the kingdom, which, being of the largest size, yield great store of milk, when turned on pastures where the grass is in sufficient abundance, or fed with a constant supply of such food as, from its succulency, conduces much towards the nutriment of the creature, and enables her to give large quantities of milk, such as turnips, grain, garden-vegetables, &c. But as these large cows require a more ample provision than would fall to their share on the generality of farms it would seem that they should not be had by those farmers, whose land is not of the most fertile kind; for, on ordinary keep, a small cow will yield a fairer profit than one of the Yorkshire or Staffordshire breed, which, having been bred on the best kind of land, would be starved, where a Scotch and a Welsh cow would find an ample supply of food. The Lancashire, or long-horned sorts of cows have been greatly improved by the exertions of the breeders in the midland districts. And those of the Yorkshire, or short-horned kind, by Sir William St. Quintin, and others.

The Herefordshire cows are large in size, handsome in form, and sleek in the coat, but are only suited to the richer sorts of land where the herbage is sweet and abundant. They usually afford a pretty fair proportion of milk, being rather suited to the making of butter and cheese. When they come to be fed, they generally fatten well and weigh heavy.

The North Wiltshire cow is also of a large kind, being adapted to the same sorts of land, on which they afford an abundant supply of good fine flavoured milk, which is productive in both cheese and butter. They have likewise the property of fattening well when they have done milking.

The North and South Wales cows do well on the poorer sorts of lands, the former, though small, give a large quantity of milk, and are very profitable. The latter also, on middling sorts of pastures, afford a good supply, and on good ones their produce is abundant.

The Kiloe sort on similar poor descriptions of land are likewise an excellent kind for milk; and have the valuable property of fattening well after the milking season is over.

The

The Suffolk duns, which are small and without horns, are by many highly esteemed for the use of the dairy, being highly productive in milk, though, perhaps, rather deficient in the supply of butter, when compared with the Lancashire fort.

The Alderney cows are a fort which are much extolled for affording fine rich milk, though less in quantity, than some other kinds, the butter being excellent in flavour. And they do tolerably well on almost all sorts of land. When fattened, they produce very good beef. See *Alderney CATTLE*.

The Devonshire breed is likewise a handsome fort, somewhat larger than the Alderney, thriving well under middling keep, standing the winter season well. They are said by some to be a profitable fort for the dairy. See *DAIRY-ING*.

There is scarcely any farm which does not admit of keeping one or more of these animals of some sort or other; but regard should always be paid to the condition of the soil. Indeed, so necessary are cows in the economy of a farm, and their produce so very advantageous, that they can hardly be dispensed with by the farmer.

The cow goes nine months with young, and but rarely produces more than one calf at a time. Where the herd is extensive, an account should always be kept of the time when each cow takes the bull, that she may be dried off at a reasonable distance of time before the expected term of gestation be completed. The most proper time for the cow to be dried off is about two months before her calving, when she ought to be suffered to lie quiet, and not be brought up with the other cows at the milking or suckling-times; for, if a cow be continued in milk nearer to the time of calving than the period above allotted, it will not only greatly injure her future progeny, by rendering it weakly and stunted, but will also have an ill effect on the health of the cow herself. Under good keep, she may, however, be milked some weeks longer.

It has, indeed, been stated by the author of *Practical Agriculture*, as probable, that "much in this business must depend on the manner in which they are kept; as where they are well fed, they may be continued in milk till within a week or two of their calving, without suffering any injury whatever from it; but in the contrary circumstances, it may be better to let them run dry for a month, six weeks, or more, according to their condition, in order to their more fully recruiting their strength. It appears, however, not improbable, but that the longer the milking is continued, the more free the cows will be from indurations and other affections of the udder; which is a circumstance deserving of attention. Where only one or two cows are kept for the supply of a family, it is likewise useful to know, that by good feeding they may be continued in milk, without any bad consequences, till nearly the time of calving. We have tried this method several times, without perceiving the least possible injury to arise from it. And in the *Agricultural Survey of the West Riding of Yorkshire*, it is stated, that no advantage was found, on trial, to result from allowing the cows to go dry two months before calving. They have there been kept in milk till within ten days of the time of dropping the calf."

When a cow is four months gone with calf, the fact may easily be ascertained by pressing upon her off-flank, where the calf will be felt to kick against the hand. These animals generally show their desire for the male, or taking the bull, by riding upon the other cows, and by the turgid appearance of their bearings. They should be well attended to at these periods. And they may be known to be near the

time of calving by springing at the udder, or at the bearing. By the term springing at the udder, is meant the collection of liquor in the bag, which, a few weeks before the time of gestation is accomplished, assumes, in some degree, the appearance of milk, and may be drawn from the teats. To spring at the bearing, is when this part is more than ordinarily large and distended. Heifers are said, by some farmers, to spring soonest at the bearing, and old cows at the udder. Cows are sometimes found to sink their calves; and whenever this accident happens, care should be taken to keep the beast apart from the rest of the herd for a night or two, lest the other breeding cows should, by a kind of involuntary impulse, unfortunately do the same. This may be owing to accidents of different kinds; but some cows are peculiarly liable to abortions; and where this happens, they should never be continued long in the herd, as being unlikely to yield any considerable degree of profit to the owners of them under such circumstances.

During the winter season, if the weather be very cold, wet, and uncomfortable, the cows which are shortly expected to calve, ought, Mr. Bannister says, to be lodged at night in a large convenient out-house, or some other place, for a week or two previously to calving; as it may be the means of saving the life of the calf, and perhaps of its dam likewise: for, when the calf drops in the yard or field under such circumstances, the hazard of its perishing through the inclemency of the weather is very great, and it may considerably endanger the life of the cow. But if from inattention, or other causes, the creature should catch cold by calving abroad in sharp winter-nights, which may be perceived by a refusal of her food, and by her trembling joints, she ought immediately to be driven into a warm shed, together with her calf, and fed with sugar sops and ale, and with the best and sweetest hay; and should not be suffered to drink any cold water. By this treatment she will mostly, he thinks, recover in a few days; but should the disorder hang about her, balls composed of aromatic cordial substances may be given, or comfortable cordial drenches.

The milk-cow is generally in her prime at five years old, and will commonly continue in a good milking state till ten years of age, or upwards; but this depends greatly on the constitution of the animal; some cows, like other animals, exhibiting marks of old age much earlier than others. They can, however, seldom be kept with advantage to nearly such an age.

It has been observed by the author of the *Synopsis of Husbandry*, that there are four different purposes to which the produce of this animal is particularly applied: the churn, cheese, suckling, and the immediate profit of the milk. This last, near large towns, is frequently carried on to a very considerable extent; so as to form business which is usually denominated cow-keeping. See *Cow-Keeping*. Where butter is the principal object, such cows should always be chosen as are known to afford the best and largest quantities of milk and cream, of whatever breed they may be. But the quantity of butter to be made from a given number of cows must always depend on a variety of contingent circumstances, such as the size and goodness of the beasts; the kind and quantity of the food; and the distance of time from calving. As to the first; it need scarcely be mentioned that a large cow will give greater store of milk than one of a smaller size; though cows of equal size differ greatly as to the quantity of cream produced from the milk of each: it is, therefore, on those cows whose milk is not only in large abundance, but which, from a peculiar inherent richness, yields a thick cream, that the butter dairy-man is to place his chief dependence; and where a

cow is deficient in either of these respects she should be parted with, and her place supplied by one more proper for this use. As to the second particular, namely, the kind and quality of the food; those who would wish to profit by a dairy ought to provide for their cows hay of the first quality, or a superior goodness to the common sort to be given them in the depth of winter, and this in an unlimited degree that they may always feed till they are perfectly satisfied. And when the weather will permit, the cows should be indulged with an outlet to marshes or low meadow-grounds, where they may feed on such green vegetables as are present; which is far preferable to the practice of confining them the whole day on dry meat, and will enable them to yield greater plenty of milk, and will give a fine yellow tinge or colour to the butter even in the winter season. As to those who confine their milch cattle to the yard in the winter time, when the weather will admit of their being turned abroad, or who fodder them chiefly on straw, they cannot expect to reap much advantage from these animals, whether kept for the pail, or for suckling: for, if the creature be refused a due allowance of wholesome and nutritious diet, how can they be expected to yield any great abundance of milk? As to the third particular: those cows will certainly give the largest quantity of milk, and of a superior quality, which have calved the latest. Hence the necessity of providing a breed of cows, which, from their conformation, bid fair to fill the pail at every meal; and of limiting the number of the herd to the size of the farm, that they may always be supplied with succulent pasture; and from hence likewise it is supposed may be adduced the propriety of attending to the peculiar property of each cow, that such as are not kindly for the pail, either by giving over their milk too early, or by continuing too long dry, may be turned off for fattening: while those which yield the richest cream, are quiet and of a good temper, and which continue to give their milk to the latest period; which are not apt to sink their calves, and which are generally healthy, may be kept on the farm with the greatest emolument, till they become incapacitated by age to yield any further profit. From these cows it is, too, that such female calves should be made choice of as are intended to be weaned, for the purpose of continuing the flock. This is a very eligible mode of practice, and deserves the attention both of the suckling-farmer and the dairy man, as it will always be found that the cows which are bred on the land will be more kindly, under similar circumstances, than those which are bought in from other pastures; and having sprung from a proper and reputable stock, will rarely fail to answer the utmost expectations of the breeder, and in the end repay all the care and expence he may have been at in the rearing and providing of them.

Those farmers, it is added, who would make the utmost advantage from cows, either as sucklers, dairy-men, or milk-sellers, should always provide a bull to run in the herd to obviate the perpetual trouble of driving them perhaps a mile or more to the bull, and in order to prevent the loss and inconvenience of their becoming frequently barren in consequence of the male not having been near them. One bull will generally be sufficient for from twenty to thirty cows. These male animals are commonly in their prime at two years old, and should seldom or never be suffered to continue longer in a state of virility than to about the fifth year; as after that time bulls which before were gentle and lay quietly in the cow-pastures are mostly apt to contract vicious dispositions, and become very mischievous and unmanageable. Whenever this happens, they should of course

be immediately castrated, and made what are termed segs or flags. See *STAG* and *SEG*.

It is farther stated, that in the vale district of Breckinghamshire and in Oxfordshire, very great numbers of cows are kept for the purpose of making butter. The fertile lands in these counties are capable of maintaining a breed of large cows, which yield great quantities of milk; so that it is not an uncommon circumstance for one farmer to keep a herd or dairy of fifty or sixty cows, and to collect a quantity of cream sufficient to fill a barrel churn of sixty gallons or more in a week. The butter made from this cream is sold by the farmer or dairy man to persons who make it their business to purchase this article at a stated price from Michaelmas to Lady-day, and at an inferior rate or price from Lady-day till Michaelmas: the butter thus collected being sent to London every week in waggons, it is consigned to the dealers, who retail it to the consumer, and no small profit from this traffic accrues to the waggon-owner and the butter-merchant. This sort of butter is mostly made up in lumps containing the quantity of two pounds each, and for that reason it has obtained the name of lump-butter. Its flavour is peculiarly sweet and agreeable, which is chiefly owing to the goodness of the pasture upon which the cows are fed; for this intrinsic merit would in vain, it is said, be sought for in butter made from ordinary pastures, how great soever may be the skill of the dairy-woman: And that though the grass should be equally luxuriant, the cows of the same breed, and the cream in like abundance, yet would a decided preference still remain in favour of the vale fed cows; for, as a fattening beast on rich land will thrive much quicker than on thin soils, though the herbage be shorter on the former than on the poor ground, so will cows give a larger store of milk, and that of a more nutritious quality, when fed on deep fertile meadows; than if depastured on those of inferior goodness or quality.

But it is well known that, besides the butter above-mentioned, large quantities are sent to the London markets from other places. Epping butter has long been held in the highest estimation; and great quantities are manufactured in Cambridgeshire, and the adjoining counties. The Cambridge butter is sent in small pans, and has an additional quantity of salt mixed with it, to ensure its keeping for ten days or a fortnight, and is generally perfectly free from any rancid taste. And farther, Yorkshire, Lincolnshire, and other neighbouring counties, where the land is rich and fertile, likewise supply large quantities of butter, which is salted and put into tubs for the southern markets.

It is stated further, that in all those counties where the profit of the cow arises chiefly from the subsequent manufacture of the butter, the whole care and management of the articles rests with the housewife; so that the farmer has little else to do but to superintend the depasturing of his cattle, the milking, churning, and, in short, the whole internal regulation of the dairy, together with the care of marketing the butter, where the same is made up wholly for home consumption, falling alone upon the wife. In this department of rural economy, so large a portion of skill, of frugality, cleanliness, industry, and good management, is required, that without them the farmer, with the utmost care, and the most assiduous attention to his business without doors, may be materially injured through the imprudence or extravagance of his wife, in the conduct of his domestic concerns. This observation will indeed hold good in many other parts of business which pass through the hands of the mistress in a farm-house; but there is none wherein the farmer may be so greatly assisted, or so materially injured, by the good
conduct

conduct or want of care in his wife, as in this sort of dairying. See BUTTER, and DAIRYING.

Where the making of cheese is the principal object of the farmer, the management, in respect to the cows, must be nearly the same as that described above. See CHEESE, and DAIRYING.

Where the cows are intended for the purpose of suckling of calves, the farmer should, it is observed, provide himself with a breed of cows suited to the quality of his land. Where the farm abounds with fertile pastures, watered with wholesome streams, and not far distant from the yard, so that the cows may be turned immediately out of the suckling-house upon their feed, the benefit will be in every respect superior to what can be expected from an arable farm, or where the green land is in a small proportion to the ploughed; for, in this latter case, the cows must depend for their sustenance and support chiefly on the artificial grasses, as they are called in many places; such as clover, trefoil, rye-grass, &c. which, besides that they are not properly adapted to the nature of this animal, will be subject to the further inconvenience of being frequently arrested in their growth by a dry summer; at which time, likewise, the ponds, if there be any in the uplands, will most probably be dry, so that the cows will be cut off from the enjoyment of solacing themselves in the water:—an indulgence which they are very fond of, as in this retreat they find a shelter and protection from the continual stings of the flies and other insects, and slake their thirst at their pleasure. Besides, by feeding in the uplands, they acquire a habit for roaming, and thus are eternally committing devastations in search of fresh aliment, not being easily restrained by hedges, or other dry fences, under such circumstances.

It has since, however, been found by further experience, that not only those grasses, which have been usually denominated artificial, may be advantageously applied as a food for milch-cows, but various other vegetables of luxuriant growth, such as the turnip, cabbage, borecole, and many other sorts. See DAIRYING.

In cases where the land is fertile, so as to produce throughout the summer great store of pasture, and a sweet and wholesome fodder for the winter consumption, it may, as has been already shewn, be advisable to purchase the larger breed of cows, such as those which are bought up from Yorkshire, Staffordshire, &c. But on poor soils, or where the arable land is in a much larger proportion than the pasture, so that the cows must depend in a great measure on the production of the sown grasses for their support, the small North Wales heifers will be found to answer every end desired from them much better than those of a heavier and more weighty kind. See CALF-Suckling, and DAIRYING.

In order to the proper management of cow-stock, the cow-houses or sheds should be of a size adapted to the number of the beasts to be contained in them. Each cow should be driven into the house at suckling-time, and her head confined in a proper manner, having some fodder lying constantly before her, and a space left between every beast. When they become once accustomed to this kind of restraint, they will without any trouble come into the places destined for them, when the calves may be suckled with the greatest ease and facility, and with the least possible waste of time. See CATTLE-Sheds, and CALF-Pens.

It has been remarked by a late writer, that “where it is not the practice to bind up the cows in houses constructed for the purpose, especially during the winter season, which seems by much the best method, warm well-sheltered yards with open sheds should be provided, in order to protect the animals, and prevent their being exposed to the weather; as

by such means they will afford much larger supplies of milk, than where they are left in a state of exposure to wet and cold in open dirty yards, as is often the case. The bottoms of yards for this use should be well laid with some sorts of hard materials, and the dung be frequently scraped off them, so as to keep them as dry and clean as possible. They should also have plenty of good clean water to drink at pleasure. If due attention be not bestowed in these respects, which is seldom done, it is impossible that the advantages that might otherwise be the case can be derived from them.”

In respect to the management of cows, so far as food is considered, it has been well suggested, “that care should be taken to keep them constantly in good condition, as, when they are ever suffered to become very lean and flat in the winter season, it is impossible that they can be brought to afford a large quantity of milk, by getting them into perfect condition in the summer months; as where cows are lean at the period of calving, no management afterwards is ever capable of bringing them to afford, for that season, any thing near the proportion of milk that they would have done, if they had been supported in proper condition during the winter. Food of the most nourishing succulent kinds should, therefore, be regularly given in suitable proportions, in the cold inclement months; and the animals be kept warm, and well supplied with pure water.” See Cow-Keeping.

Cow-Bane, a name provincially applied to a weed (*athusa cynapium*), which is found in arable fields, and is noxious to man; but which cows, horses, sheep, goats, and swine, eat without injury. According to Withering, it is likewise noxious to geese. It should be kept from spreading in corn fields.

Cow-Clogs, a term often provincially used to signify the clotted lumps of hard dirt which hang to the buttocks of cattle, or other animals which are tied up in the house during the winter season.

Cow-Ground, a word provincially used in some districts to signify a cow-pasture.

Cow-Herd, a term applied to a person whose office it is to attend upon and take care of the herds of cattle, in districts where they run in common pastures.

Cow-Herd Milk, a term applied to such as is obtained from the cow-herd.

Cow-House, the name of the building or place where cows or other cattle are kept, in order to protect them from the effects of the winter season. See CATTLE-Sheds.

Cow's Island, in Geography. See VACHE.

Cow-Keeping, in *Rural Economy*, a term signifying the business or practice of keeping cows, with a view of deriving profit from the sale of the milk in large and populous towns. The business of dealing in milk has been considerably increased during the last half century, so as to be at present in many situations a very extensive concern. In the county of Middlesex, the number kept by the London dealers in milk, are stated by the intelligent author of the Agricultural Report of that district, to stand as below:

		<i>Middlesex.</i>		
Tothill-fields	}	-	-	285
Knightbridge		-	-	
Edgware Road		-	-	550
Paddington	}			
Tottenham-court Road				
Battle-bridge				
Gray's Inn Lane				3950
Bagnigge-Wells				
Idington				
Carried over				4785

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	Brought forward	4785
Hoxton	-	150
Ratcliff	-	205
Mile-End	-	406
Lime-Houfe	-	180
Poplar	-	70
Bethnal-Green	-	200
Hackney	-	600
Bromley	-	160
Bow	-	100
Shore-Ditch	}	
Kingfland	}	200
Odd cows	-	234
<i>Kent.</i>		
Deptford	}	
Rotherhithe	}	
Greenland-Dock	}	681
New-Crofs	}	
Bermondsey	}	
<i>Surrey.</i>		
Lambeth	}	
South-Lambeth	}	
Kennington-Bridge	}	
Cold-Harbour	}	619
Peckham	}	
Peckham-Rye	}	
Newington	}	
Camberwell	}	
Total		8590

It has been stated, that in the neighbourhood of different villages round the metropolis, as Hackney, Islington, Paddington, and many others, the cow-keepers secure every inch of land they can meet with; and that some of them have remarkable large stocks of these animals. One of these, on the different farms which he possesses in these neighbourhoods, has nearly 1000 cows, having often been asserted to have had more than 990, and once to have been within one of a thousand. The last number of these cows are said to be worth the vast sum of 23,000*l.*, affording an annual produce of about 38*l.* each, which is 38,000*l.*, and as the net profit of each cow will be shewn below to be 6*l.* it is obvious that the keeper of 1000 cows must derive the large annual amount of 6,000*l.* from them: an immense sum, when the smallness of the trouble is considered. And as the population in these different places has considerably increased since the period at which this statement was made out, it would seem not improbable but that the number at present stands much higher. The scarcity of grass-land in the immediate vicinity of the metropolis has now rendered it necessary for this sort of dealers to remove to a greater distance than was formerly the case, which they are enabled to do by means of light carts, and a peculiar mode of conveying the milk in a sort of tin jars slung in them.

It is sufficiently obvious, that the practice of the milk-dealer is only capable of being carried on with adequate profit and advantage in cases where abundance of all sorts of food, both for the summer and winter support of the animals, can be readily provided, and in situations where the population is such as to afford a ready and certain demand for the produce at all seasons. Under other circumstances this system of management cannot be pursued with any chance of success.

In the execution of this plan of management, a circum-

stance on which much depends, is that of providing such cows as are properly adapted to the intention, which is that of a full supply of milk, without much regard to the quality. Of course, the cows to be chosen for this purpose are, such as are capable of yielding the largest possible quantity of milk, with the least possible consumption of food. But though the profits of the cow-farmer must materially depend upon this circumstance, it does not appear to have been much regarded, or in any way subjected to the test of experiment. The nature of the keep, in respect to quantity and nutritive properties, will, in a great measure, lead to the proper choice of cows; as they should never be disproportionately large to the nature and kind of food which they are to receive. As in most cases of this sort of management the food is both rich in its quality, and capable of being applied in an abundant manner, the large breeds may be had recourse to with the greatest chance of profit in general, though, under particular circumstances, the smaller sorts may now and then be employed. This seems to agree pretty well with the actual state of the stock in most instances of this kind of farming, as we find the large short-horned Holderness breed commonly employed, though, in particular cases, the smaller sorts, as the long-horned Suffolk and polled breeds, are introduced.

In the stocking of cow-farms, the great consideration should, of course, be that of the means of support which the farmer has in his power for the animals; but there are some other circumstances which should, in part, direct his conduct. It has been stated, by a writer of considerable information on the subject, that, though the large breeds of cows may at first, while the supply of food is of the green succulent kind, and in large proportion, afford a greater abundance of milk, yet that the smaller sorts often continue to yield a more regular supply for a much greater length of time, which more than compensates the difference in the quantities on the commencement of the milking in the former sort.

In regard to the form, such cows should constantly be selected for this purpose as are wide in the horn, when of those breeds which are horned; thin in the head and neck, which have the dewlap not too pendulous or hanging down too much; the carcase rather flattish, with much depth; the hips wide, and somewhat pointed, having the buttocks round and fleshy; thin in the legs, but with short joints; the udder capacious, without being fleshy, and stretching well backwards, with the milk veins large, and strikingly apparent; the teats large, and of a good length, having the surface skin fine and even.

It is likewise a matter of much consequence in this sort of management, to have the cows of a tame and gentle disposition.

As the quantity of the milk, as already observed, is the primary object in this practice, all such cows as do not afford it in an adequate proportion to the consumption of food in their keep, should be immediately parted with, as not affording a due profit in this system.

If we recur to the actual practice of the Middlesex cow-keepers, we shall find, that they almost wholly and invariably have recourse to the large short-horned Yorkshire breed, which they purchase of the dealers or jobbers in cattle at the different fairs and markets in the country districts, and especially near the capital, where new supplies from the country are weekly exposed, which enables them to keep up their stocks with much facility and convenience. They are procured by these dealers at first from the breeders, when from three to four years old, and in calf. There is likewise another way in which they are provided for this use by the

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milk-dealers in the metropolis, which is, by commissioning proper persons to purchase the necessary lots at the different country fairs and markets, in order to their being sent up to them under the care of drovers.

The prices of these cows have of late been greatly increased, being at present seldom less than from 15 to 25 or 30 guineas *per* cow. And in other smaller parts not less than from 10 to 15 or 18 guineas the cow.

It is not the practice of the cow-keeper to breed, except in particular cases, where the cows are remarkable for giving large quantities of milk. They rarely pay any sort of attention to the quality of the bulls which are employed in this sort of business. See Cow.

The cheapest season for the buying in of these animals is, when there is plenty of food in the autumn, or about the commencement of the winter. Vast savings may often be made by having them purchased at this period.

In this system of practice, where any number of cows are kept, it is always proper to have bulls running along with them, as by such means they are not only induced to take them more readily, but with greater certainty, and the inconvenience of driving them to a distance avoided. One bull is fully sufficient for 20 or 25 cows.

The author of the Synopsis of Husbandry has afforded a variety of remarks on this kind of management, some of which may be interesting to farmers of this description. "In cases," says he, "where the chief design of profit from cows is the immediate sale of the milk, which, near a large town, is certainly, he thinks, the most advantageous plan, if the circumstances of the farm admit of its being carried on. And, in general, he thinks, the shorter the distance between the cow-yard and place of sale, the more conveniently will this branch of business be conducted, and the larger the profits arising from it; so that such farmers as live in the outskirts of a large town enjoy the fullest advantage from the sale of their milk, and possess a preference in every respect over those who live at the distance of a mile or more from the place of sale. Such farmers will always, he supposes, give greater satisfaction to their customers, by supplying them with milk fresh from the cow, than the cow-keeper who lives at a distance, and who has no such advantage; for the milk, having been perhaps half an hour or upwards undulating in the pails, will, by that means, have lost much of its original sweetness, and be totally unfit for keeping: nay, in hot weather, the jolting of the pails will often have so much injured its quality, as to render it scarcely fit for present use, allowing it to have been brought neat and unadulterated from the cow. Another disadvantage with which the country milk-man has to struggle, is, he observes, the greater expence in carriage; to which may be added the unbounded confidence he is, from necessity, compelled to place in the person who carries the milk, which it is great odds but he abuses, by purloining no inconsiderable part of his receipts. Yet, notwithstanding these disadvantages, a farmer, even at two miles distance from the place of sale, may find, he conceives, a larger profit accrue from this practice of selling the milk, than either from suckling or making butter, provided he can always meet with a ready sale, and at a good price; out if he has his milk frequently returned on his hands, or cannot, even in the summer season, sell it at three-pence a quart, it will by no means be prudent to follow the practice. But lately, from the enormous increase of the price of land about large towns, there can be no doubt but that the system of the cow-keeper or milk-dealer, may, in many instances, as noted above, be conducted with sufficient profit at several miles distant from

towns where the consumption of milk is large, as is at present the case with those sorts of dealers in the metropolis. And from the lands at such distances being less impregnated with dung, it seems not improbable but that the milk may be of a better quality and flavour, in consequence of the natural grasses being more predominant, and of a less luxuriant growth.

It is necessary in this business that great regard should be paid to the nature and size of the cows; which, as has been already observed, should be adapted to the state of the pasture, or other kind of food on which they are to be fed. Where the grass land is rich and fertile, as has been already noticed, it may be stocked with the large Holderness and Staffordshire bealts, which will yield great store of milk at every meal: but such weighty cows demand a much more ample supply of nourishment than those of inferior size; so that not only the grass in the summer must be in the greatest abundance, and produced from pastures of the most fruitful soil, but the winter provision be also in equal proportion. When the weather will not admit the milking cows to be turned into the pastures in the day-time, and during the nights whilst they lie in the yard, they ought by no means to be stinted in hay, which should be the produce of the richest meadows, sweet and well made. Succulent food likewise of different kinds should be provided for them, in order to increase their milk, and enable them to yield the greater profit. To this purpose, turnips should annually be raised as contiguous to the yard as circumstances will admit, and a tub should never be wanting in the cow-house filled with fresh grains. These grains and turnips should be given alternately to the cows in troughs fixed under their yokes; and the cows should be driven into the house some time before milking, and allowed to remain there a small time afterwards. Neither is this allowance of succulent food less necessary for cows of inferior size; which, although they will thrive on more barren pastures in the summer, and with good well-flavoured straw in the winter season, require but a small portion of hay, and will eat greedily of ordinary fodder, and yield milk in abundance where cows of a larger carcase would refuse the meat, or fall off their milk: yet even in this case the like cautions are to be observed of baiting these small cows with turnips or grains in the winter, to prevent a decrease in the milk. But it is to be remarked, that these small cows consume either in grass, dry fodder, or other provender, a far less quantity than is required for the first mentioned kind, and are therefore better adapted to every farm: those excepted in which the pastures are of the richest and most fertile kinds. Among cows of this kind, kept for this purpose, there are degrees of size; but of these smaller bealts, those are to be accounted as proper for pastures where the soil is of a middling nature, such as the general run of marshes on the borders of the Thames, in Kent and Essex, which, when fattened, will arise to sixty stone. But those of a more ordinary kind, Welsh cows of forty-eight or fifty stone, are sometimes to be preferred; some of which are very good, and in proportion to their size will yield large meals of milk; though it must be confessed, that cows of a weight between this Welsh breed, and the large Staffordshire and Holderness kind, such as mentioned above, are in general the most profitable; and where the land is so poor as not to afford a maintenance for these, it will rarely be found advisable to stock such ground with cows in the view of profiting from the pail.

The necessity of giving the milch-cows grains during the winter months, is another reason, he thinks, why the farm on which it is proposed to carry on this business should be situated near a large town: since it is necessary that these

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grains should be fetched twice or three times a week, in order that the cows may have them perfectly sweet; for they will refuse this diet with loathing when it has acquired an ill taste, which it will do in a very short time, when the water is suffered to continue in the grains.

The cow-keepers in the neighbourhood of London, where they make great use of this sort of food for the subsistence of their herds, have contrived a method of keeping the grains in pits, which being filled with them, and trodden tight down, are then covered over; and by this method they are preserved from the month of March till the summer, when the brewing is discontinued, at which time they are dug out perfectly sweet; the earth at top, and a thin covering from the surface of the grain, which may have contracted a mouldiness, having been first taken off. They may in like manner be kept in tubs or casks, which having holes bored at the bottom to let off the moisture, are to be placed on sleepers six or eight inches from the ground. By being closely pressed down in these tubs, the moisture passes off through the holes at the bottom; and the grains by these means may be preserved for several months without acquiring any ill taste; though to a country cow-keeper it would seldom be found necessary to keep them so long, since the only use which he has for grains is as a winter food. In the summer time there will be a sufficient quantity of grafs, the most natural aliment, and with which the cow-keepers about London cannot be supplied in a degree equal to the demands of their numerous herds. By this method of keeping grains in these reservoirs, the farmer may supply himself with this necessary article at times when he has little other employment for his horses; as in a frost, or in rainy weather, which may render the operations of the field impracticable or inconvenient: and whilst the weather permits the plough to work, it will not be necessary to take the horses off for the performance of these occasional jobs.

The above method of managing the cows is principally practised by the country milk-dealers; a considerably different system being pursued by the cow-keepers in the vicinity of the metropolis. It is stated in the excellent Survey of that county by Mr. Middleton, that there "even in summer, and when the grafs is in the greatest plenty, the cows are regularly fed with grains; which, though the quantity of milk is thereby increased, by no means add to its quality. The general allowance is forty-five quarters of grains *per* week (at 1*s.* 10*d.* *per* quarter) to every twenty-five cows. They are given them twice a-day; and they have, besides, two meals of turnips and hay. Some cow-keepers have tried salt, he says, mixed with the grains, more with a view to preserve the grains longer in a sound state, than from any consideration as to the health of their flock, or the improvement of the quality of the milk. It is acknowledged that the cows eat the grains so mixed with great avidity; but the proprietors not getting an adequate return for their trouble and expence, he does not find that it is now much practised."

And it is added in the same report, that during the night the cows are confined in stalls. About three o'clock in the morning each has an half-bushel basket of grains. From four o'clock till half past six they are milked by the retail milk-dealers, who contract with the cow-keepers for the milk of a certain number of cows, at one shilling and tenpence for eight quarts: this, however, varies with the distance from town. When the milking is finished, a bushel basket of turnips is given to each cow; and very soon afterwards they have an allotment, in the proportion of one truss to ten cows, of the most grassy and soft meadow hay which had been the most early mown, and cured of the greenest

colour. These several feedings are generally made before eight o'clock in the morning, at which time the cows are turned into the cow-yard. About twelve o'clock they are again confined to their stalls, and served with the same quantity of grains as they had in the morning. About half past one o'clock in the afternoon the milking commences in the manner above described, and continues till near three, when the cows are again served with the same quantity of turnips, and, about an hour afterwards, with the same distribution of hay as before described.

"This mode of feeding generally continues during the turnip season, which is from the month of September to the month of May. During the other months in the year they are fed with grains, cabbages, tares, and the foregoing proportion of rowen, or second-cut meadow-hay; and are continued to be fed and milked with the same regularity as before described, until they are turned out to grafs, when they continue in the field all night; and even during this season they are frequently fed with grains, which are kept sweet and eatable for a considerable length of time by being buried in pits made for that purpose," as described above.

It is stated by the writer of the Agricultural Survey of the West-riding of Yorkshire, that in the vicinity of the large manufacturing town of Leeds, in that district, the cow-keepers in some cases feed their cows with cut-grafs in the summer season, and brewers' grains, without straw, in the winter. And that near the populous town of Sheffield, the most experienced in this sort of business, make use of five hundred weight of linseed dust in mixture with three hundred weight of bran, in the course of the week, for every six cows; while others apply a quarter of a peck of beans, with a peck of grains, as one feed for one cow three times during the day. And though these are expensive methods of feeding, they are found to answer well in some cases.

In the feeding of cows it has been attempted to prove by different correct calculations, that a larger profit may be obtained by keeping them in the house, and supplying them with green and other proper food, than in the common mode of permitting them to collect their own food in the pastures: in support of which the writer of the Agricultural Report of the West-riding of Yorkshire states, that by keeping cows upon red clover and rye-grafs, tied up in the house in the day time during the summer season, only putting them out after milking in the evening for the sake of air and water, one acre of the former has been found to go as far as two under the pasturing system; besides the affording a larger supply of milk. The largeness of the quantity of manure that is thus raised, and its superior richness, are supposed to compensate for any additional trouble or expence that may be incurred in the cutting and removing the food to the cattle yards.

In respect to the use of cut-grafs for soiling or feeding in the yards; Mr. Middleton has, however, offered some remarks in opposition to the late recommendations of different writers. He conceives that the practice of cutting and carrying the grafs, to be consumed in the sheds by the cows instead of permitting them to collect it themselves, can only be supported without exhausting the land so as to leave nothing for the slythe, in such cases as where half the extent can be annually manned; or in such flooded meadows as can be covered with water occasionally in the summer and other seasons. In all other circumstances such a system would, it is supposed, quickly prove ruinous to the land.

Besides, it is suggested that the great labour and expence of such a plan must render it uneconomical; as one person so employed with a horse and cart, could not bring in the produce of many acres, and at the same time attend the

cows,

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cows, though it would annually stand the farmer at the rate of more than an hundred pounds. It is also supposed to have other disadvantages, though it prevents the injury of poaching. It is stated that a man might cut two acres in the week, and cart the grass, suppose eight tons, into the yards, besides attending the cattle, which is equal to the consumption of about six head of cattle, and supposing this should be continued fifteen weeks, thirty acres would be cleared once, or ten acres three times. Of course it would require such a number of men as could not be conveniently procured. It is concluded, therefore, to be one of those closet systems which cannot be profitably reduced to practice over more than a very few acres of land, and then only when done without any addition of men or horses.

In the practice of J. C. Curwen, Esq. M. P. as detailed in the fifth volume of Communications to the Board, it was found highly advantageous and economical to supply the cows immediately after milking in the morning, with a stone of steamed chaff each, which had been prepared the preceding night, and was now become sufficiently cold for use. And this was followed by three pounds of oil-cake. The animals were then turned out to water; when, on returning to their sheds, green food was given them in the proportion of about a stone. Before the period of milking in the evening another feed of chaff was given, and after it a second feed of green food; and at six o'clock a foddering of straw in the quantity of six or eight pounds was administered.

The daily expence of feeding *per* cow in this way is thus stated:

sto. lb.		<i>d.</i>
2 0	Of green food	$0\frac{1}{2}$
2 0	Of chaff, &c.	2
0 3	Of oil-cake	3
0 8	Of straw	1
4 11 each		$6\frac{1}{2}$

But it is suggested that, if the cake was well reduced to powder, a pound and an half, or two pounds at most, would be fully sufficient, which would reduce the expence to not more than five-pence the day. The cake is found to have a great effect in the produce of milk as well as in improving the condition of the cows, especially when combined with the chaff. With this treatment the produce was about eight quarts wine measure *per* day, with a breed of small cows. The use of cole as a green food was likewise found to have a wonderful effect in promoting the quantity of milk.

In feeding cows with hay and ground oats, the quantity and expence were found to stand thus *per* day:

	sto. lb.
Hay - -	1 6
Green food	2 0
Ground oats	0 4
	3 10 which costs $9\frac{1}{4}d.$

It would seem from Mr. Curwen's trials, that by combining some sort of stimulant dry food with that of a green kind, a very beneficial effect was produced in the increase of the quantity of milk. And the London cow-keepers have long been aware of the advantage derived in this system from the use of soft green rowen hay or such as has heated but little in the stack.

In regard to the manner of applying such food as is employed in this system of practice with the most success and benefit, it has been observed by Dr. Dickson, in his system

of Practical Husbandry, after noticing the several kinds of succulent and other food which is had recourse to in the common methods of supporting the animals, that by such "meats much juicy matter is thrown into the system, and a continual varied stimulus kept up, by which a large increase of milk is produced." And that "as the different articles thus employed must have less effect in exciting the secretory organs of the animals, in proportion to the frequency of their use, the utility of varying their food as much as possible, is rendered sufficiently obvious. On the same principle there are, says he, probably various other substances, as well as these, that might be made use of with great benefit; but too few experiments have yet been made with them in this view to lead to any useful conclusions." And there is another circumstance which he suggests as worthy of the consideration of the cow-keeper in the keeping of his cows, "which is that of the dry food being properly proportioned to that of the green or rich succulent kind, as, where this is not well attended to, the cows by being kept in too lax a state of their bowels, from the great tendency which such materials have to run off in that way, may afford a much less quantity of milk than would otherwise be the case. We know, continues he, from repeated experiments that considerable loss sometimes takes place in this manner. In the foddering of the cows, he likewise advises, that, "regard should also be had to supply them with the food in such a way as to excite the secretions in as regular a manner as possible. In this view too much food should never be given at one time, but supplied more frequently, as three or four times, or oftener, in the course of the day." It is suggested that "this practice will likewise have an advantageous effect in having the fodder more cleanly eaten up."

Great regard should likewise be paid to the watering of the cows in this plan of management, as much depends upon it in respect to the quantity of milk which is afforded. It was found by an experienced cow-keeper, that the more clean and pure the water was, the more the secretion of milk was excited. The London milk dealers must of course suffer great loss in not attending more to this point, as their cows are often permitted to drink the most filthy, stagnant, putrid water, in the ponds which adjoin their cow-yards. Where running streams are not at hand, this inconvenience might often be easily obviated by the contrivance of proper long troughs or cisterns, which might be filled from pipes or the roofs of the buildings.

In this practice the cow-keepers in London never suckle the calves, but in from two to three or four days, as the circumstances may be, they are sent to the markets to be sold, as they could not be disposed of before. Of course the cows are left in full milk from within a few days of the time of their calving, which is a great advantage. This method cannot however be followed in country situations in general, from there being little demand for the new dropped calves, they must consequently be suckled by the milk-dealer.

The length of time which the cows are kept in this practice, is not certain or regular, being mostly determined by the milking, such as are good milkers being continued much longer than where the contrary is the case. When they fail in their milk they should probably always be disposed of as soon as possible. In this system it is obvious, that young cows must constantly afford the best profit; but they may perhaps be profitably kept till the third or fourth calf, and in some cases even longer.

In the practice of the London milk-men, the cows are often suffered to remain in the dirty yards, without being sufficiently

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sufficiently protected from the weather, even during the winter season; but this should constantly be avoided by having proper sheds, or other low buildings, constructed for them, and to which, if stalls for tying them up were added, it would probably be so highly convenient and beneficial as to repay the expence in a very short time. The influence of the atmosphere is so greatly prejudicial to these animals, that they cannot be too much guarded against its effects. Mr. Curwen found it produce a difference in the milking in a small number of cows of more than two gallons at a meal.

The yards in which they are contained should be sufficiently spacious, in proportion to the number of cows which are to be kept, in order that they may be airy, being well enclosed with low fences, and the bottoms laid with some hard durable sort of materials. Mr. Middleton has recommended for this purpose lime rubbish and chalk, which, he says, makes a firm sound bottom, by which poaching is prevented, and the dirt rendered easily capable of being scraped off, and the yards be kept clean.

May 21, 1789.				
First meal,	-	-	-	9 $\frac{1}{2}$
Second ditto,	-	-	-	13
				22 $\frac{1}{2}$
May 22.				
First meal,	-	-	-	13
Second ditto,	-	-	-	8
Third ditto,	-	-	-	5
				26
May 23.				
First meal,	-	-	-	12
Second ditto,	-	-	-	7
Third ditto,	-	-	-	6
Fourth ditto,	-	-	-	1
				26

In the milking of the cows in this, as well as the dairy practice, greater attention is perhaps necessary than is commonly bestowed upon the business, to procure the greatest possible quantity of milk. It has been advised on the well known physiological principle of the secretions of animals, being increased in proportion to the frequency of withdrawing the fluid, that more frequent milkings should be had recourse to, in order to augment the quantity of milk in these animals.

By thus producing a habit in the organs, which perform this office, it is not improbable but that the quantity afforded, in a given time, may be greater than in other cases; but in order to effect the business perfectly, great care and attention are requisite, both to the feeding and to exactness in the times of milking, as well as to the drawing away every drop of the fluid at each operation. With the view of subjecting this matter to the test of experiment, Mr. Macro has recorded the following trials in the twelfth volume of Mr. Young's Annals of Agriculture.

October 22, 1789.				
First meal,	-	-	-	11
Second ditto,	-	-	-	6
				17
October 23.				
First meal,	-	-	-	11
Second ditto,	-	-	-	3
Third ditto,	-	-	-	3
				17
October 24.				
First meal,	-	-	-	10
Second ditto,	-	-	-	1 $\frac{1}{2}$
Third ditto,	-	-	-	1 $\frac{1}{2}$
Fourth ditto,	-	-	-	3
				16

To have afforded any satisfactory results, these experiments should have been much longer continued and more varied in the periods of drawing the milk, as well as carefully compared with the quantity, and kind of food on which the cows were fed, and by thus determining what depends on simply withdrawing the milk, and what on the nature and quantity of the food consumed, the influence of the practice might be ascertained.

In this intention it has been advised to milk the cows when well fed in the summer season, three times in the course of the day at equal distances of time, by which some have supposed the augmentation in the quantity of the milk to be nearly one-half of the whole quantity, while others consider it as much less: but were a third more obtained, the additional trouble and expence would be fully compensated. More experiments require to be made in this view to fully decide the benefit that may be thus derived.

The practice of cow-farmers, in general, is merely that of having the milk withdrawn twice in the period of twenty-four hours, the operation being performed about seven o'clock in the morning, and five in the afternoon. But with

milk-dealers it is usual to have it performed at from four to about six in the morning, and from a little after one to three in the afternoon. In these cases more frequent milkings would probably not answer to the cow-keeper. But the business should be so executed as that no milk be left undrawn, as otherwise not only loss in the milk, but in the cows becoming more quickly dry may be sustained. The work should also be performed as expeditiously as possible, and with great circumspection in regard to cleanliness. A good milker is capable of finishing from six to eight cows in the hour.

The profit of this system of management must be different, according to circumstances of different kinds; but, in general, is accomplished with less trouble and expence than most other modes of farming practice.

In the Survey of the County of Middlesex, it is stated that, from the facts which are there brought forward, it would seem that there are kept for the purpose of supplying the capital and its vicinity with milk, about the number of eight thousand five hundred milch-cows; and that according to the information which has been procured, the quantity

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of milk, which is afforded by each cow, is, on an average, about nine quarts in the day, which is equal to, *per annum*, 3285 quarts.

The calf takes part of the milk, it is observed, for the first two or three days, during which time it would not be saleable; and there is a falling off for a few days before the cow calves: these occasion a deduction of about eighty-five quarts, leaving the annual saleable produce of each cow about 3200 quarts, which, at the present price of two-pence three farthings the quart, amounts to £36 13 4
To which sum add for a calf, at two or three days old, from 25s. to 31s. 6d. the medium is about - - - - - 1 6 8

And it gives the total annual produce, *per cow*, about - - - - - £38 0 0

which, on 8500 cows, amounts to 317,400*l. per annum.*

Expences of Keep.

The cow-keepers feed their cattle very highly, in order to their producing the greatest possible quantity of milk. The expence is nearly as follows:

	£.	s.	d.
Turnips 7 cwt. or 14 bushels <i>per week</i> each cow, at 3 <i>d.</i> is	0	3	6
Brewer's grains, 7 bushels, at 5 <i>d.</i> or more, is	0	2	11
Hay, one trufs and a half, <i>per week</i> , at 2 <i>s.</i> 6 <i>d.</i>	0	3	9

The expence of the food of a cow *per week* is 0 10 2

which is nearly equivalent to 26*l.* 13*s.* *per ann.* and that sum taken from the produce in milk and calf, as before stated, of 38*l.* leaves - £11 7 0

The price here charged for the hay may perhaps, he says, be deemed low; but it will not appear to be so when it is taken into the account, that the cow-keepers mow their land two or three times in a season, as their object is to procure the most grassy and soft hay they can. It is likewise not burthened with market charges.

In Mr. Curwen's method of keeping cows, the expences and profits for the space of 220 days, with cows of the smaller kind, are thus stated:

<i>Dr.</i>		£	s.	d.
To keep for 220 days at 6 <i>d.</i> <i>per day</i> ,	-	5	10	0
To labour in attendance of cows	-	2	0	0
To loss, risks, &c. &c.	-	3	0	0
	£	10	10	0

There are several other charges to be sustained by the cow-keepers, particularly,

	£.	s.	d.
Interest of stock annually	-	1	5 0
Damaged and lost cattle	-	0	7 0
Horses, harness, and waggons	-	1	15 0
Rent of Buildings	-	0	10 0
Hire of servants	-	1	0 0
Expences of fairs and markets; unforeseen expences and losses	}	0	10 0
Amounting annually, <i>per cow</i> , to	-	5	7 0

which, taken from the 11*l.* 7*s.* before mentioned, leaves a remainder of the nett profit of each cow about - - - - - 6 0 0

The produce of a cow, as found by the late Mr. Harper, near Liverpool, in the management of an industrious cow-keeper, was nine quarts of milk *per day*, on the average, the whole year through, which was sold at 2*d.* the quart, with the advantage of selling cream. But there is a discount to be made, as when the summer months come in there is often a great flow of milk comes out of the country, which reduces the average of both milk and cream to two-pence *per quart* the year through.

To 3235 quarts of milk, at two-pence *per quart*, - - - - - £27 7 6

To the average keep of a cow in grains, &c. for one year, at 4 <i>s.</i> 6 <i>d.</i> <i>per week</i>	11	14	0
To 160 stone of hay at 8 <i>d.</i> <i>per stone</i>	5	6	8
To 16 weeks grafs at 3 <i>s.</i> 6 <i>d.</i> <i>per week</i>	2	16	0

Together - - - 19 16 3

Remains - - - 7 10 10

for interest of stock, losses in cattle, and profit.

<i>Cr.</i>		£	s.	d.
To 8 quarts of milk <i>per day</i> for 220 days, at 2 <i>d.</i>	14	13	4	
To 33 carts of manure	-	1	13	0
To calf	-	2	0	0
	-	18	6	4
Cost	-	10	10	0
Clear profit	-	£7	16	4

It is stated further, by the author of the Middlesex Report, that "the consumers pay four-pence halfpenny *per quart* to the retailers. If the latter were to sell the milk pure and unadulterated at this price, it would yield them a profit of 64*l.* *per cent.* But, in order to discover the actual profit of the retailers, we must add eight-pence for cream short-measure, and the extraneous articles mixed with it, which increases 3*s.* the usual price of eight quarts, to 3*s.* 8*d.*; and, as it costs them only 1*s.* 10*d.* there remains for labour and profit 100 *per cent.* thus the retailer clears 36*l.* 13*s.* 4*d.* by every cow. On the whole, they are stated to divide among them the unreasonably large sum of

308,833*l.*; and the sum paid for milk amounts to 626,233*l.*

"When the families of fashion are in London for the winter season, it is supposed that the consumption, and consequent deterioration, of milk are at the highest. During the summer months, when such families are for the most part in the country, the milk may probably be of rather a better quality. The cream is taken from so much of it as remains unsold, and made into fresh butter for the London markets. The butter-milk is given to the hogs.

"The milk is always given in its genuine state to the retail dealers; and, as it is sold to them by the cow-keepers after

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after the rate of two-pence three-farthings *per quart*, and is retailed by them at four-pence halfpenny *per quart*, the profit is surely so large as ought to prevent even the smallest adulteration. But when it is considered how greatly it is reduced by *water*, and impregnated with worse ingredients, it is much to be lamented that no method has yet been devised to put a stop to the many scandalous frauds and impositions in general practice, with regard to this very necessary article of human sustenance. It is certainly an object well deserving the particular consideration of the legislature. It cannot be doubted that many persons would be glad to make some addition to the price now paid for it, (high as that price is,) provided they could, for such increased price, procure so useful an article in domestic economy perfectly genuine."

But besides this, it has been stated in the same report that "it is a common practice with the retailers of this useful article to carry the milk first home to their own houses, when it is set up for half a day, when the cream is taken from it, at least all that comes up in that time, and it is then sold for new milk; by which means, what is delivered in the morning is no other than the milk of the preceding afternoon, deprived of the cream it throws up by standing during that time. By this means, a further considerable profit accrues to the retailer, and the milk is rendered less nutritious. It is suggested as a matter of surprise, that in the city of London, so long and deservedly famous for the attention and vigilance of its magistrates, in the conduct and regulation of the markets, no notice has hitherto been taken of, or any means adopted to prevent, the abuses so generally and justly complained of in an article, the consumption of which, in London and its environs, is greater than in half the cities of Europe. Milk, says the able writer, has always been a favourite part of the food of Britons; and in a great and populous city, it is highly conducive to the health of its inhabitants. "Lacte et carne vivunt," says Cæsar in his Commentaries.

The same writer adds, in regard to the management of the cows, that "five or six men only are employed in attending near three hundred cows;" and that "as one woman cannot milk more than eight or nine cows twice a day, what part of the business would necessarily be attended with considerable expence to the cow-keepers, were it not that the retailer, as before observed, agrees for the produce of a certain number of cows, and takes the labour and expence of milking on himself." In this practice too, with the London cow-keepers it is observed that "every cow-house is provided with a milk-room, (where the milk is measured, and served out by the cow-keeper,) and this room is mostly furnished with a pump, to which the retail-dealers apply in rotation, not secretly, but openly before any person that may be standing by; from which they pump water into the milk-vessels at their discretion. The pump is placed there, it is said, expressly for that purpose, and indeed is very seldom used for any other. A considerable cow-keeper in Surrey has a pump of this kind, which, the writer says, goes by the name of the famous black cow, (from the circumstance of its being painted black,) and is said to yield more than all the rest put together. Where such a pump is not provided for them, things are much worse; for in that case the retailers are not even careful to use clean water. Some of them have been seen to dip their pails in a common horse-trough; and, what is still more disgusting, though equally true, one cow-house happens to stand close to the edge of a stream, into which runs much of the dung, and most of the urine, of the cows; and even

in this stream, so fully impregnated, they have been observed to dip their milk-pails.

"A cow-keeper informs the author, he says, that the retail milk-dealers are, for the most part, the refuse of other employments; possessing neither character, decency of manners, nor cleanliness. No person could possibly drink of the milk, were they fully acquainted with the filthy manner of these dealers in it. The same person, he also observes, suggests, as a remedy for these abuses, that it would be highly proper for every retail milk-dealer to be obliged to take out an annual licence from the magistrates; which licence should be granted only to such as could produce a certificate of good conduct, signed by the cow-keeper, and a certain number of their customers; and also on their being sworn to sell the milk pure and unadulterated."

It is observed by the writer of a work entitled "Synopsis of Husbandry," that "of the several different ways of raising a profit from milch-cows, that of selling the milk, where circumstances will allow of its being carried on to a due extent, is by far the most eligible. In the economy of making butter and cheese, the trouble and expence are daily and perpetual. Several extraordinary domesticities must be employed, where the dairy is large; and no small allowance of fuel is necessary, that boiling water may be still at hand, to scald the pails and other utensils employed on the occasion." That "in suckling, also, the charges are much heavier than when the milk is sold out of the pail; for sucklers are continually wanted, which are often bought in at very advanced prices; and sometimes these are not to be procured at any rate, just when they may be required; so that either the calves, which are ready for the butcher, must be kept a week or two longer than would otherwise have been necessary, in which the farmer will rarely find his account; or, if these calves are sold off, there will be an overplus of milk, of which it will be found difficult to make any profit, since it will not produce a quantity of cream sufficient to make any advantage by the butter. Now the milk-man, it is remarked, has none of these inconveniences to struggle with; and, whilst the cows continue to yield an ample produce, and this goes off at a quick sale, the whole of the business is performed with little trouble; and, what is an additional advantage, each cow yields a profit before her milk is sent to market, by the sale of the young calf; whereas the suckling farmer, as was mentioned before, is often under the necessity of purchasing such young calves to keep up his stock: a balance greatly in favour of those persons who make sale of their milk."

And it is further observed, that "on farms where there are many cows maintained, either for the profit of the milk, or the fatted calf, it will be often necessary, on a variety of accounts, to buy in fresh stock, either to supply the place of those which are rendered unfit for these purposes by age or accident, or to furnish an additional demand for milk, &c. In order, therefore, that the utmost emolument may be reaped from his profession, it will be convenient that the farmer do not embark further in the business than he can carry on to the greatest possible advantage; so that whenever a cow is to be turned off, and another bought in to supply her place, a pasture may be in readiness to receive the former, where she may remain to fatten, or to recover from disease, as the case may be; whereas, if the farm be fully stocked with milch-cows, those which are turned off must immediately be driven to market, and sold at a low price, to make room for their successors, which in all probability were bought in at a dear rate." See DAIRYING, and Cows.

This system of farming is one which, from the many conveniences and little trouble or risk which attends it, should never be lost sight of by those farmers who are situated contiguous to large towns, or villages, or even on the banks of canals at some distance, by which the produce can be readily and cheaply conveyed to them. And it is the more necessary to be regarded, in consequence of the increasing demand for the produce, and its vast utility in the rearing of the children of the rich, as well as those of the labouring poor.

Cow-Leaf, in *Agriculture*, is a term applied to such grounds, whether meadows or pastures, as are preferred for the purpose of being depastured with cows.

Cow-Mig, in *Rural Economy*, is a provincial term often applied to the drainage of cow-sleds, dunghills, and cow-stalls.

Cow's Mouth, in *Geography*, a cavern so called by the Hindoos, near 300 miles above the place where the Ganges enters Hindoostan. According to Mr. Daniel's sketch, to which major Rennell refers, this is above the Upper Gan-goutra, which is about 150 geographical miles from Sirinagur. See GANGES.

Cow-Par, in *Rural Economy*, is a word sometimes provincially made use of to signify a cow-yard, fold-yard, or straw-yard, where cows are turned in for the purpose of eating the straw.

Cow-Parsley, in *Botany*. See CHÆROPHYLLUM.

Cow-Parsley, in *Rural Economy*, a name frequently applied to a plant (*Chærophyllum sylvestris*) which is common in pasture grounds, and which is said to indicate a fruitful soil. Cows are said to be fond of it even to such a degree, according to Mr. Wainwright, that about Dudley, when the pastures are over-run with it, as frequently happens, they are constantly turned in to eat it up. Rabbits relish it; but neither horses, sheep, nor swine, choose it. From its being one of the most early plants in rising in the spring, it might perhaps be converted to use as an early green food. In the beginning of April it has often the height of two feet, or more. It should be eradicated from all pasture grounds, as injurious to the natural grass, and as spreading itself rapidly by seeds. The roots, from being perennial, are often very troublesome, and difficult to be destroyed.

Cow-Parsnep, in *Botany*. See HERACLEUM *sphondylium*.

Cow-Parsnep, in *Rural Economy*, the name of a plant (*Heracleum sphondylium*) which is very troublesome as a weed in some grounds, and which rises to the height of nearly three feet. Rabbits, hogs, and asses, eat the leaves with eagerness; and it is likewise eaten by cows, goats, and sheep; but horses refuse it, or eat it indifferently. It is known by various names, as wild parsnep, meadow parsnep, madnep, hogweed, &c. It is a plant which contains a large proportion of saccharine matter in its constitution.

Cow-Quakes, in *Botany*. See BRIZA.

Cow-Quakes, in *Rural Economy*, the name often given to a plant of the grass kind (*Briza media*), which is frequent in fields and pastures of the more wet kind. It is eaten by cows, goats, and sheep. The land should be well drained to get quit of it.

Cow-Rake. See COWL-RAKE.

Cow, Sea, in *Zoology*. See SEA-COW.

Cow-Tie, in *Rural Economy*, the name often provincially made use of to signify the short thick hair-ropes, which has a wooden nut at one end of it, and an eye at the other, that is employed by the milker to hopple the hind-legs of the cow during the time of milking, and keep her quiet and secure from kicking and overturning the pail.

Cow-Weed, in *Botany*. See CHÆROPHYLLUM.

Cow-Weed, in *Rural Economy*. See COW-PARSLEY.

Cow-Weed, a name applied to a plant frequently met with in both tillage and pasture ground, (*Melampyrum arvense*.) of which there are different species, as the *pratense* and *sylvaticum*. It has a seed somewhat similar to that of wheat, from which its name has probably arisen. This, when ground with the grain, is said to give it a dark colour and bitterish taste; though Ray asserts, that he could not perceive any unpleasant relish in the bread with which it was blended. Cows and goats eat the plant, according to Withering: but sheep refuse it. And Miller considers it as a delicate food for cattle, especially such as are under the process of fattening, and for cows; suggesting that it may be worth while to cultivate it for these purposes. Where the meadow-foxtail (*pratense*) abounds, it is asserted by Withering that the butter is yellow and uncommonly good, when made from the milk of cows feeding upon it. Sheep and goats eat it, and cows are fond of it; but swine, though they are very fond of the seeds, refuse the plant; which is also the case with horses.

The yellow kind (*sylvaticum*) is likewise, according to the same authority, eaten by cows, sheep, and goats, which, when plentifully supplied with the plant, soon get into condition. The seeds, when shed in the autumn, rise in the spring; but, in other cases, do not come up till the second year after sowing. The best sort should be kept out of corn-fields, as being a troublesome weed.

Cow-Yard, is the name of the enclosed place in which cows are kept and sheltered from the severity of the weather. They should be made spacious, and laid with solid materials in the bottoms, in order to prevent poaching.

COWARD, a term in *Heraldry*, applied only to the lion, when his tail is represented hanging down and passing between his legs.

COWARDICE, in *Pathology* and *Ethics*, denotes that habitual temper and disposition, which disqualifies from opposing the dangers and difficulties which it is our duty or interest to combat; and every indication of cowardice is an indication of culpable and unmanly fear.

COWAY STAKES, in *Geography*, a place of England, near Walton upon Thames, in the county of Surrey, where Cæsar is said to have passed this river into Middlesex.

COWBRIDGE, a market town in Glamorganshire, Wales. The ancient name is *Pont y fôn*; but the natives have changed the latter word to *faen*, or *Pont y faen*, *Stone Bridge*. Robert de St. Quintin, who afterwards built Llanblethian castle, and who was lord of the territory, walled the town with stone in 1091; a handsome gate of which still remains. It is situated in a remarkably fertile and pleasant valley, generally called the "Vale of Glamorgan," or the "Garden of Wales;" and consists principally of one street, tolerably well built, about three-quarters of a mile in length. The parish church is a handsome edifice. There is a town-hall, and the county Bridewell stands within the ancient walls. The quarter-sessions of the county are held here annually at Easter; and the Glamorganshire races alternately at Cowbridge and Cardiff. The free school, though not originally founded by Sir Jewelina Jenkins, secretary of state in the reign of Charles II., is indebted to that gentleman for considerable assistance towards the general purposes of the institution, which possesses two fellowships, two scholarships, and an exhibition at Jesus College, Oxford. There is, besides, a good school for reading, writing, and arithmetic. The town is governed by two bailiffs, twelve aldermen, and twelve common-council-men; and it

has a town-clerk, &c. &c. The market day is Tuesday, and there are three annual fairs.

COW and CALF Pasture Rivers, are head branches of Rappahannock river, in Virginia.

Cow and CALF Rocks. These are the names of some rugged rocks projecting out of the sea off Trevor Head, near Padstow in Cornwall. The highest of these rocks had its situation determined in the government trigonometrical survey in 1795, by an observation from St. Agnes Beacon, distant 94,650 feet, and bearing $23^{\circ} 7' 22''$ S.W. from the parallel to the meridian of St. Agnes; and another from Karuminnis, distant 169,450 feet: whence is deduced its latitude $50^{\circ} 32' 45''.7$ N., and its longitude $5^{\circ} 2' 22''$, or $20' 9''.5$ W. of Greenwich.

COWDEN, a rectory in Kent, in the lath of Sutton. The situation of its steeple was settled in the government trigonometrical survey in 1799, by an observation from Frant steeple, distant 41,943 feet, and bearing $67^{\circ} 18' 3''$ S.E. from the parallel to the meridian of Greenwich; and another from Bidborough station, distant 30,485 feet, bearing $72^{\circ} 17' 27''$ N.E. from the same parallel: whence is deduced its latitude $51^{\circ} 7' 34''.2$ N. and longitude $0^{\circ} 6' 9''.9$ E. of Greenwich.

COWE, the capital town of the Cherokee Indians, situated at the foot of the hill, on both sides of the river Tennessee. At this place terminates the great vale of Cowé, exhibiting one of the most charming mountainous landscapes that can be seen. This vale is closed at Cowé by a ridge of high hills, called the "Jore mountains." The town contains about 100 habitations. In the constitution of the state of Tennessee, Cowé is described as near the line which separates Tennessee from Virginia, and is divided into Old Chota, another Indian town, by that part of the great Iron or Smoky mountain, called Unicoi or Unaca mountain.

COWEN, a river of Wales, which runs into the Tawe, in the county of Carmarthen.

COWES, a sea-port town on the N. coast of the Isle of Wight, seated on the river Medan, which divides it into East and West Cowes. It is a place of good trade, and a great resort of merchant ships, which often lie here for convoy. Passage-boats are continually passing between this place and Portsmouth and Southampton; and the packet with the mail from the island to London sails from this place; 9 miles W.S.W. from Portsmouth, and 10 S.S.E. from Southampton. In the progress of the government trigonometrical survey in 1793, the exact situation of the summer-house, belonging to the horse-shoe inn above this town, was determined by an observation from Butser-hill, distant 115,573 feet, and bearing $41^{\circ} 57' 52''$ N.E. from the parallel to the meridian of Dunnoke; and from Rook's-hill, distant 140,005 feet: whence is deduced its latitude $50^{\circ} 44' 35''.1$, and its longitude $1^{\circ} 18' 33''.7$, or $5' 14''.2$ W. of Greenwich.

COWETAS, or **KOWETAS**, a town of the Lower Creeks in East Florida, called the "Bloody-town." It lies on the west bank of Chata-Uche river, and contains 280 persons.

COWIE, a river of Scotland, which runs into the sea a little to the N. of Stonehaven, in the county of Kincardin.

COW-ITCH, in *Botany*. See *DOLICHOS pruriens*.

COWL, or **COUL**, *Cuculla*, a sort of hood, worn by certain monks. See **COUL**.

COWL, *Friar's*, in *Botany*. See *ARUM maculatum*.

COWL, in *Rural Economy*, the name often applied, in different districts, to signify a sort of tub, particularly that which is used in the making of cheese.

COWL, a provincial term, frequently made use of to denote the raking or scraping of any thing, as dung, &c. together.

COWL-Press, a provincial word, employed to signify a sort of lever.

COWL-Rake, the name of a sort of tool of the rake kind, which is employed in scraping up mud, dirt, or other matters from the surface. It is usually pronounced *cow-rake*.

COWLEY, **ABRAHAM**, in *Biography*, was born at London in the year 1618. His father was a grocer, and, according to Dr. Johnson, he was probably a dissentor from the established church. He died, however, before the birth of his son Abraham, the care of whom devolved wholly on the mother, who, when he became of a fit age, obtained for him a place in Westminster school, as king's scholar. He is represented as having been so deficient in memory as to have been unable to retain the common rules of grammar; but his biographer, already referred to, seems to suppose that he was able to perform his exercises without them, and, being an enemy to constraint, he spared himself the trouble. At any rate, he laid in a good stock of classical learning, and attained a correct and elegant taste. While he was at school, he published a collection of verses, under the title of "Poetical Blossoms;" he was then but 13 years of age, and his "Tragical History of Pyramus and Thisbe" was written three years before this; and when he was 15, he wrote his "Constantia and Philetus." At this early period he likewise produced a comedy, entitled "Love's Riddle," which was published after he had been some time at Cambridge, whither he went in 1636. The early productions of this young man were distinguished rather for a moral and sententious turn, than for any extraordinary flights of imagination. At Trinity College he soon soared above his contemporaries, and appeared as an author by publishing, besides the "Love's Riddle," a Latin comedy, entitled "Naufragium Joulare," which was acted before the university by the members of his college. At the beginning of the civil war, as the prince passed through Cambridge, he was entertained with the representation of the "Guardian," one of Cowley's comedies, which was afterwards surreptitiously printed during his absence from the country. He continued to reside at Cambridge, where he had obtained his degree of master of arts, when he was ejected from Cambridge by the Puritan visitors. From Cambridge he went to Oxford; published a satire, entitled "The Puritan and Papist;" and so distinguished himself for his loyalty, that he gained the kindness and confidence of those who attended the king; and was honoured with the particular friendship of lord Falkland. When Oxford surrendered to parliament, Cowley followed the queen to Paris, and was secretary to the earl of St. Albans. He was also employed in the correspondence carried on in favour of the royal cause, and particularly in cyphering and decyphering the letters that passed between the king and queen, which occupied his nights as well as his days. In the midst of these serious and very important avocations he published a collection of amorous poems, entitled "The Mistlefs." In 1656, having no longer any affairs to transact abroad, he returned to England, and, very soon after, published an edition of his poems. In the search for another person, Cowley was arrested and imprisoned, but liberated by the generosity of Dr. Scarborough, who gave bail for him in the sum of 100*l*. It is supposed that he came home with a view of benefitting the party, whose cause he had espoused; and to dissemble his design, it was said that he wished to be regarded as a physician, and accordingly took his degree. In the character of Dr. Cowley he appears among the experimentalists who laid the foundation of the

Royal Society. On the death of Cromwell he went again to France, and became a second time an agent in the royal cause; and when Charles II. was restored to the throne of these realms, he returned and was in hopes of some signal reward for his many services: but after a considerable lapse of time, during which he made many fruitless applications, he obtained what was equal to about 300*l. per annum*. He had already, from a desire of retirement, taken his abode at Barn-elms on the banks of the Thames, and seems to have had enough of the world to desire never to engage again in its vexations and changes. From Barn-elms he removed to Chertsey, where he lived but a short time; but long enough to find that neither his body nor mind were properly adapted to this new scene. He died at the Porch-House in Chertsey, in the year 1667, in the 49th year of his age. He was buried near Chaucer and Spencer in Westminster Abbey, with great pomp; and the king himself became his eulogist, by saying that "Cowley had not left a better man behind him in England." By Dr. Spratt he is represented as the most amiable of mankind, to which no one ever objected. He was of a free and independent spirit, modest, sober, and sincere; of gentle affections, and moderate wishes; neither making a parade of his own merits, nor undervaluing those of others.

For a complete account of Cowley as a poet, and of his various pieces, we refer to Johnson's *Lives of the Poets*; where, among other things, we are told, "that Cowley brought to his poetic labours a mind replete with learning; and that his pages are embellished with all the ornaments which books could supply; that he was the first who imparted to English numbers the enthusiasm of the greater ode, and the gaiety of the less; that he was equally qualified for sprightly sallies and for lofty flights; that he was among those who freed translation from fervidity, and, instead of following his author at a distance, walked by his side; and that, if he left versification yet improveable, he left likewise, from time to time, such specimens of excellence as enabled succeeding poets to improve it." *Biog. Brit.* Johnson's *Lives of the Poets*.

COWLEY, in *Geography*, one of the Gallapagos islands, in the Pacific Ocean, situated under the equinoctial line.

COWLEY, a rectory in Middlesex, in the hundred of Elthorn, is situate near to the Colne river, at the point where that river, owing to the strata dipping faster than its bed, obtains the top of the London-clay stratum, and where the Grand Junction Canal leaves the vale of Colne, and changes its course towards the east, upon the top of the clay stratum. The first lock which occurs in proceeding along the canal from Paddington is in this parish, called Cowley Lock.

COWPEN *Colliery*, in the parish of Horton in Northumberland, is one of those works which contribute to the supply of the London market; called Cowper, by an error of the press, (see COAL;) and is situate on the south side of the Blyth river, to which it has a rail-way laid, for the conveyance of large waggons laden with coals to the shipping staiths on the river. Cowpen main coals obtain a better price than many other sorts, on account of their quality of burning freely.

COWPER, WILLIAM, in *Biography*, a very distinguished modern poet, descended from an ancient and highly respectable family, who can trace their ancestry as far back as the reign of Edward IV., was born at Berkhamstead in Hertfordshire, November 26, 1731. His father, Dr. John Cowper, was rector of the parish, and nephew to lord chancellor Cowper. The infancy of Cowper was extremely delicate; and his constitution at that early period discovered a tendency to diffidence, to melancholy, and despair, which

darkened, as he advanced in years, into periodical fits of the most deplorable depression. In quitting the house of his parents, he was sent to a reputable school at Hertford, under the care of Dr. Pitman. From hence he was removed, in consequence of some complaint in his eyes, to which he himself alluded in a letter to Mr. Hayley, his biographer. "I have been," says he, "subject to inflammations of the eyes; and in my boyish days had specks on both, that threatened to cover them. My father, alarmed for the consequences, sent me to a female oculist of great renown at that time, in whose house I abode two years, but to no good purpose. From her I was sent to Westminster school, where, at the age of fourteen, the small-pox seized me, and proved the better oculist of the two, for it delivered me from them all; not, however, from great haziness to inflammation, to which I am in a degree still subject." At Westminster he acquired the classical knowledge and correctness of taste for which he is celebrated; yet he was often heard to deplore the persecution he sustained, both here and at Hertford, from the cruelty of his school-fellows, not daring, to use his own expression, to raise his eye above the shoe-buckle of the elder boys, who were apt to tyrannize over his gentle spirit. The acuteness of his feelings, in his childhood, rendered those important years, which might have produced, under tender cultivation, a series of lively enjoyments, miserable years of increasing timidity and depression, which, in the most cheerful hours of advanced life, he could hardly describe to an intimate friend without shuddering at the recollection of his early wretchedness. At the age of eighteen he exchanged a public school for an attorney's office. He resided three years in the house of a Mr. Chapman, to whom he was engaged by articles for that time. After this period he settled himself in chambers of the Inner Temple, where he resided till he was 33 years of age. Even here his native diffidence confined him to social and subordinate exertions: he wrote and printed, but it was as the concealed assistant of less diffident authors. He had, however, an opportunity, which he embraced, of cultivating the friendship of some eminent literary characters, who had been his school-fellows at Westminster, particularly Colman, Bonnel Thornton, and Lloyd, who are referred to in the course of our work. See CHURCHILL, &c. Of himself Cowper says in a letter to Mr. Park: "From the age of 20 to 33 I was occupied, or ought to have been, in the study of the law; from 33 to 60 I have spent my time in the country, where my reading has been only an apology for idleness; and where, when I had not either a magazine or a review, I was sometimes a carpenter, at others, a bird-cage maker, or a gardener, or a drawer of landscapes. At 50 years of age I commenced an author: it is a whim that has served me longest and best, and will probably be my last." Lightly as this most modest of poets has spoken of his own exertions, and late as he appeared to himself in producing his chief poetical works, he had received from nature a contemplative spirit perpetually acquiring a store of mental treasure, which he at last unveiled to delight and astonish the world. He began, however, his poetical career at the age of 14, by translating an elegy of Tibullus; and there seems to be no room to doubt that in his early life he wrote many poems of great merit, which are probably for ever lost to the world. In his 31st year he was nominated to the offices of reading clerk and clerk of the private committees in the house of lords; but the peculiarities of his mind rendered him unable to support the ordinary duties of his new office; for the idea of reading in public proved a source of torture to him. An expedient was devised: he resigned his situation of reading clerk, and was appointed clerk of the

journals in the same house. This change, it was hoped, would render it unnecessary for him to make a personal appearance in parliament. Certain unexpected business, however, called upon him to appear at the bar of the house of lords. His terrors on this occasion overwhelmed his reason. Though he had prepared himself for his public duty, he was sure, that all his knowledge, acquired with much assiduity and toil, would forsake him at the bar of the house. This distressing apprehension increased to such a degree, that he was not only unable to make the experiment, but the very friends, who called on him for the purpose of attending him to the house, acquiesced in the cruel necessity of his relinquishing the prospect of a station to which, it was now evident, he was unequal. The conflict between the wishes of his ambition, and the terrors of diffidence so completely overwhelmed his health and his mental faculties, that it was found necessary to remove him to St. Alban's, where he resided a considerable time, under the care of Dr. Cotton, an eminent physician, the author of some well-known poems.

"The misfortune of mental derangement," says Mr. Hayley, "is a topic of such awful delicacy, that I consider it as the duty of a biographer rather to sink in tender silence, than to proclaim, with circumstantial and offensive temerity, the minute particulars of a calamity to which all human beings are exposed, and, perhaps, in proportion as they have received from nature those delightful but dangerous gifts, a heart of exquisite tenderness and a mind of creative energy." From December 1763 to the following July, the mind of Cowper appears to have laboured under the severest sufferings of morbid depression. At length, by the medical skill of Dr. Cotton, the indescribable load of religious despondency, which had borne down the admirable faculties of this worthy man, was removed. His ideas of religion were changed from the gloom and terror of despair to the lustre of comfort and delight; and in the spring of 1765 he removed to a private lodging at Huntingdon, where he was soon introduced to the family of Mr. Unwin, which afforded him every consolation and aid that his circumstances required. It is not possible, in a work of this kind, to follow our poet through all his scenes of retirement. On the death of Mr. Unwin, he removed with his widow to Olney in Buckinghamshire. This happened in October, 1767, which was thenceforth the principal residence of Mr. Cowper. His retirement was ennobled by many private acts of beneficence; and his exemplary virtue was such, that the opulent sometimes delighted to make him their almoner. In his sequestered life at Olney, he administered abundantly to the wants of the poor, from a fund with which he was supplied by the late John Thornton, esq. Before he quitted St. Alban's, he even took upon himself the charge of a necessitous child, in order to extricate him from the perils of being educated by very profligate parents: he put him to school at Huntingdon, removed him on his own removal to Olney, and finally settled him as an apprentice at Oundle in Northamptonshire.

At Olney he contracted a close friendship with the late reverend Mr. Newton, then minister there, and who for many years past, till within a few weeks, was the rector and very popular preacher at St. Mary Woolnoth, Lombard-Street, London, whose religious opinions were in unison with his own. To a collection of hymns published by Mr. Newton, Mr. Cowper contributed a large number of his own composition. To the public he first became known as a poet by the publication of a volume in 1782. If the pieces of which it consisted, and which were written in rhymed heroics, did not at once place the author high in the scale of poetic excellence, they sufficiently established his claim to originality,

and gave tokens of a genius rather kept down by his subject than deficient in native powers. The style is rather strong and forcible than poetic: though often prosaic, he is never flat or insipid; and sometimes the poet breaks through in a vein of lively description or bold figure. In 1785 he published a second volume, which raised him to an equality, of reputation at least, with any of his contemporaries. The principal part of this volume is occupied by the poem, entitled, "The Task;" a name given it from the injunction of a lady upon him to write in blank verse, for the subject of which she gave him "The Sofa." It commences with some sportive discussions of this topic; but it soon falls into a serious strain of moral descriptions, intermixed with excellent sentiments and portraitures, with no perceptible method, but freely ranging from thought to thought, from the image to its improvement, as unshackled fancy happens to suggest. "It is difficult," says an able critic, "to determine which is the most conspicuous excellence of this charming production. In the description of natural objects, it unites the most minute accuracy with striking elegance and picturesque beauty. The pious and moral reflections of the "Task" touch the heart with irresistible force; and its delineations of character are life itself. The personifications and allegorical figures interspersed, display high powers of fancy; and the figure of Winter riding on his sledge car, may vie in sublimity with any poetical effort of imagination." There is added to this volume a piece, entitled, "Tirocinium, or a Review of Schools," which possesses great merit, and is replete with striking observations. The popular story of "John Gilpin" shews that Mr. Cowper had a strong perception of the ludicrous, naturally balancing in his disposition the gloomy propensity which circumstances rendered finally predominant. With a view of losing in employment those distressing ideas, which were ever apt to recur, he undertook a translation of Homer's Iliad and Odyssey into blank verse; which he performed with great ability, and which was to the author a valuable source of innocent amusement; and its completion is mentioned by him with the regret felt on parting with a beloved companion. Nothing, however, was capable of durably relieving his mind from the horrible impressions which it had undergone; and almost absolute despair was the state in which it finally settled. The reader would not fail of receiving a deep, though melancholy, interest in every event of Mr. Cowper's life, did our limits allow us to trace them over. His letters contain a rich store of intellectual pleasure for those who are capable of refined feelings, and of estimating high moral excellence: for these, which will unquestionably live as long as our language exists, we refer to the "Life" by Mr. Hayley. It remains for us only to notice the last struggles of this worthy man and exalted poet. He passed some of his latter years under the affectionate care of a relation at East Dereham in Norfolk; nor did he entirely drop his literary employments, and the occasional composition of poetical pieces, till a short time before his death. In the beginning of the year, 1800, a rapid decline of health was evident to all those about him; and on the 19th of April, the close of a life so wonderfully chequered, and so universally interesting, appeared to be very near. On the next day he seemed to revive; but on the 25th, at five in the morning, a deadly change appeared in his features. He spoke no more. His last words were uttered in the night; in rejecting a cordial presented to him, he said, "What can it signify!" Yet even at this time he did not seem impressed with the idea of dying, although he conceived that nothing would contribute to his health. The deplorable inquietude and darkness of his latter years were terminated by a most gentle and tranquil dissolution. He was

was buried in St. Edmund's chapel, in Dereham church, where a tablet is raised to his memory by his affectionate friend and relation, lady Hesketh.

The person and mind of Cowper seem to have been formed with equal kindness by nature; and it may be questioned, if the ever bestowed on any man, with a fonder prodigality, all the requisites to conciliate affection and to inspire respect. He was beloved and revered by all who knew him, with a sort of idolatry. "I may," says Mr. Hayley, "be suspected of speaking with fond partiality the unperceived exaggerations of friendship; but the fear of such a censure shall not deter me from bearing my most deliberate testimony to the excellence of him whose memory I revere, and saying, that as a man he made, of all men whom I have ever had opportunities to observe so minutely, the nearest approaches to moral perfection. Indeed a much more experienced judge of mankind, and Cowper's associate in early life, lord Thurlow, has expressed the same idea of his character; for being once requested to describe him, he replied, with that solemn air of dignified elocution, by which he was accustomed to give a very forcible effect to a few simple words, "Cowper is truly a good man." Hayley's *Life and Posthumous Writings of William Cowper*, &c. Gen. Biog.

COWPER, WILLIAM, a celebrated surgeon and anatomist of London, was born about the middle of the seventeenth century, but in what year, or in what place, is not known. Of his first work, "Myotomia Reformata, or a new administration of all the Muscles of the Human Body," which was published in London in 1694, in 8vo. Haller says, "Although it may not be compared with the later works of Albinus on the subject, yet it far excels all that had preceded it, in correctness, and as containing delineations and descriptions of several muscles that had not been before observed." A splendid edition of this work was published by Dr. Mead in 1724, in folio, several years after the death of the author, with an introductory discourse on muscular motion, and some but not very important additions. More attention, on the whole, appears to have been paid to the elegance, than to the correctness of the figures, in this edition. In 1697, the author published, at Oxford, in folio, "The Anatomy of Human Bodies." The greater part of the plates, with which this magnificent work is illustrated, was purchased by some London bookseilers, in Holland, and belonged to Bidloo's anatomy. Our author added 40 figures, from drawings made by himself. He also very much improved, and corrected the descriptions of the figures, given by Bidloo, and added some ingenious and useful anatomical and chyrurgical observations. Bidloo, and with reason, complained of the plagiarism. Cowper answered his complaints, in a publication, called "Eucharistia," in which he gives a description of some glands, seated near the neck of the bladder, which have obtained the name of Cowper's mucous glands. He pretended to believe that the plates belonged to a work, projected by Swammerdam, but this excuse, for which there was no foundation, gained little credit. Two later editions of this work, which is still in great request, have been published, the one at Leyden, in 1737, the other at Utrecht in 1750.

Cowper was also author of several communications to the Royal Society, on the subjects of anatomy and surgery, which are printed in their Transactions, and of some observations inserted in the *Anthropologia* of Drake. He died in the year 1710. Haller Bib. Anat. General Biog.

COWPER'S Glands, in *Anatomy*, are two glandular bodies, varying in size, and situated at the bulb of the urethra.

Cow-Pox, or Cow-Pocks, in *Medicine*, the popular name

of a disease which, till lately, was never described by medical writers.

§ 1. Its Description and Origin.

This disease, in the brute animal, is commonly called the cow-pox; in the human subject the cow-pock. It appears on the teats of cows, in the form of irregular pustules, surrounded with inflammation. The colour of the pustules is a palish blue, approaching to livid. The animals become indisposed; and the secretion of milk is much lessened. Solutions of *cerussa acetata*, *vitriolum zinci*, *vitriolum cupri*, and other astringents, are a speedy remedy for the pustules; otherwise they degenerate into troublesome and obstinate ulcerations.

Similar effects are produced on the hands of the milkers; attended with febrile symptoms, and tumours in the armpits. The disorder is also sometimes communicated to other parts of the body by the nails of the patient, or some other cause.

It is the popular opinion in the county of Gloucester, and some other counties, that the cow-pox derives its origin from the heel of a horse; and that men who are employed in dressing horses, and also in milking, from want of cleanliness, transfer the virus from the horse to the cow. Dr. Jenner, however, is of opinion, that it is the thin fluid, of a darkish colour, oozing from a recent crack in the heel, and not the thick matter of grease, which possesses the property of exciting this disease; and that there is no other source to which the genuine cow-pox can be traced.

Many instances of this disorder in the human subject, together with the most authentic and satisfactory evidence of its originating from the horse, may be found in Dr. Jenner's "Inquiry into the Causes and Effects of the Variolæ Vaccinæ," published in 1798, in the London Medical Review, the Medical and Physical Journal, and in Ring's "Treatise on the Cow-pox," of which the first volume was published in 1801, the second in 1803.

It appears by the writings of Dr. Jenner, that farriers are frequently insusceptible of the small-pox, in consequence of their having been infected with this disease from the horse. It is, however, not always confined to the heel of the animal. Dr. Jenner relates a case, in which matter from the shoulder, and Dr. La Font of Salonica one, in which matter from the leg produced the genuine affection.

One strong argument, that it never proceeds from any other origin than the horse, is, that it has never been observed in Cheshire; where it is not customary for men, who have the care of horses, to be employed in milking.

Matter taken from the horse by Dr. Loy of Whitby, proved equally efficacious with that from the cow, both in the inoculation of the cow, and of the human subject. Dr. Sacco of Milan also made the same experiments with the same success. A portion of the same virus was transmitted by him to Dr. de Carro of Vienna, and by Dr. de Carro to Dr. Fries of Silesia; both of whom use it indifferently with vaccine matter, and find it produces a similar effect.

Some people suppose, that the cow-pox derives its origin from the small-pox; and that the infection is communicated to the cow by the hand of the milker; but this hypothesis is neither warranted by reason, nor confirmed by fact. There is no analogy to render it probable, that any poison is thus mitigated by transmission through the brute animal. The experiment has often been tried in many parts of the world. A local pullule has sometimes been excited; but the matter which it yielded has not succeeded in subsequent inoculations.

Were the cow-pox thus communicated to the cows, it would

would be as common in Cheshire as in Gloucestershire, as common in Scotland or France as in England, and as common in Asia or America as in Europe. As an additional proof that it is not thus produced, it will be sufficient to state the information received from Mr. Dalton, a surgeon at Madras. After observing, that he had not been able to procure genuine matter in India, in order to make experiments, or even to learn that horses in India are subject to the greafe, he gives the result of repeated experiments which he made in the government gardens at Madras, by order of the governor, earl Powis, and in his presence.

To render these experiments as complete and satisfactory as possible, several milch-cows were selected; and some of them were inoculated by Mr. Dalton, in their teats and udders, with the most active variolous matter; while the teats of others were rubbed with it for a considerable time, till they became highly inflam'd. No pustule was excited in any one of them; but ulcerations appeared on those teats, into which matter had been rubbed, the third day after the friction. Several young children were inoculated with the matter thus produced, and their arms inflamed and festered. They had also a slight degree of fever, which gave Mr. Dalton hopes that his experiment had succeeded, and that he had generated a mild species of small-pox; but on putting them to the test of variolous inoculation, they all had the small pox in the most indubitable manner, and regularly went through the disease. Mr. Dalton concludes with remarking, that all these circumstances will bear the strictest scrutiny: as they are well known to several medical practitioners at Madras.

§ 2. *On the Discovery and early Practice of Vaccination.*

It has been justly observed, that, for the discovery of this excellent art, we are indebted, under providence, to a fortunate concurrence of circumstances: first, to the talents of Dr. Jenner, secondly, to his education under the celebrated Hunter, and thirdly, to his situation in the vale of Gloucester. His inquiry into the nature of the cow-pox commenced about the year 1776. His attention to this singular disease was first excited by observing, that among those whom he inoculated for the small-pox, many were insusceptible of that disorder. These persons, he was informed, had undergone the casual cow-pox, which had been known in the dairies from time immemorial; and a vague opinion had prevailed, that it was a preventive of the small-pox.

He met with many apparent exceptions to this rule; which led him to ask the opinions of other medical practitioners in the neighbourhood, who all agreed, that the prophylactic power of the cow-pox was not to be relied on. This for a while damped, but did not extinguish his ardour; for he had the satisfaction to learn, that the cow was subject to various eruptions, called by that name, all of which were capable of infecting the hands of the milkers. Having surmounted this obstacle, he formed a distinction between the different kinds of pustular eruptions, to which the cow is liable; denominating one species the true, and all the others the spurious cow-pox.

This impediment to his progress was not long removed, before another, of far greater magnitude in appearance, started up. Instances were not wanting to prove, that when the genuine cow-pox broke out in a dairy, some persons who had experienced the disease resisted the small-pox, and others continued susceptible of that distemper. This obstacle, as well as the former, gave a painful check to his fond aspiring hopes; but reflecting that the operations of nature are for the most part uniform, and that when

two persons have had the cow-pox, it is not probable one should be perfectly shielded from the small-pox, and the constitution of the other remain unprotected, he resumed his labours with redoubled ardour.

The result was fortunate; for he now discovered that vaccine, as well as variolous matter, undergoes a change; and that when it has lost its specific property, it is still capable of producing a pustulous eruption. Hence, a person who milks a cow one day, may receive the infection of the genuine cow-pox, and be rendered for ever secure from the infection of the small-pox; while another, who milks the same cow the next day, may have a pustulous eruption, and perhaps a constitutional indisposition to a considerable extent, yet still remain susceptible of the variolous contagion.

While thus investigating the nature of the cow-pox, he was struck with the idea, that it might be practicable to propagate the disease by inoculation, after the manner of the small-pox; first, from the cow, and then from one human subject to another. The first case in which he put his theory to the test inspired him with confidence; and a regular series of experiments, which he afterwards instituted for that purpose, was crowned with success. Several persons were successively inoculated from each other with vaccine matter, and afterwards exposed, in a variety of ways, to the infection of the small-pox, which they all resisted.

This happy discovery was communicated to the world by Dr. Jenner, in a treatise published in June 1798, entitled, "An Inquiry into the Causes and Effects of the Variolæ Vaccinæ, a Disease discovered in some of the western Counties of England, particularly Gloucestershire, and known by the name of the Cow-pox." The result of his further experience was also brought forward in subsequent publications, in the course of the two succeeding years; and the whole work has been since republished in one volume. He has also written a small tract, entitled, "The Origin of Vaccine Inoculation;" from which the preceding account of this most singular improvement of the healing art, is, in a great measure, extracted.

It has been justly remarked, that the same fortune which has attended all other great discoveries, and all other great benefactors of mankind, attended Dr. Jenner on this occasion. Envy assailed his fame; his discovery was first depreciated, then denied; and as he surpassed Harvey himself in glory, so he also surpassed him in the opposition which he had to encounter. Truth, however, ultimately prevailed. Vaccination obtained a complete triumph; and the foes of Jenner and humanity were covered with confusion.

In July 1798, Mr. Cline inoculated a child with vaccine virus, received from Dr. Jenner; which succeeded. He afterwards put the child to the test of inoculation with small-pox matter in three places; which he resisted. On this occasion, Mr. Cline informs Dr. Jenner, that Dr. Lister, formerly physician of the Small-pox Hospital, and himself, are convinced of the efficacy of the cow-pox; and that the substitution of this mild disease for the small-pox, promises to be one of the greatest improvements ever made in medicine. He adds, the more I think on the subject, the more I am impressed with its importance. This instance of the *first* introduction of vaccine inoculation into the metropolis, it was necessary to mention; because another medical practitioner has laid claim to that honour. Attempts were made by Mr. Cline to continue the practice, by vaccinating other subjects with the virus thus produced; but they proved abortive; probably from the matter not being taken at an early period of the disease.

In November 1798, Dr. Pearson published his "Inquiry concerning the History of the Cow-pox, principally with a view

view to supersede and extinguish the Small-pox." In this work he brings forward the result of an extensive correspondence with medical practitioners, and others, in different parts of the kingdom; tending to confirm Dr. Jenner's opinion, that the cow-pox is a preventive of the small-pox. He had been informed of this discovery of Dr. Jenner by Mr. Hunter, nine years before; and had constantly mentioned the circumstance, in every course of his lectures, from that time. The fact had been mentioned in three publications: by Dr. Adams, in his "Treatise on Morbid Poisons;" in 1795, and by Dr. Woodville, in his "History of Inoculation," in 1796; having been communicated to them by Mr. Cline, and to him by Dr. Jenner. It had also been mentioned by Dr. Beddoes, in 1795, in his "Queries concerning Inoculation," in a letter from Mr. Rolph, who was acquainted with Dr. Jenner.

Information concerning the prophylactic property of the cow-pox had been given to Sir George Baker, many years before, by his relation, the Rev. Herman Drewe, of Abbots, in Dorsetshire, and several medical practitioners; but not gaining credit, it was never published. The same circumstance had also been noticed in a weekly paper, called "General Amusements," published at Gottingen in 1769. The author, whose name was not announced, speaking of the diseases said by Livy to be common to men and cattle, observes that the cow-pox prevails in the neighbourhood of Gottingen, and infects the milkers; and that those who have had the cow-pox, flatter themselves they are perfectly secure against the infection of the small-pox. He also tells us, he had made many inquiries, and was well assured by very respectable persons, that this opinion of the milkers was well-founded.

But the most ancient reference to the prophylactic power of this disorder on record, is probably that in "Ring's Treatise on the Cow-pox," p. 167. It is as follows: "Being desirous of knowing, whether there was any allusion to this disease in any ancient author, I wrote to Dr. Jenner on that subject; who favoured me with the following answer:" "I know of no direct allusion to the disease, in any ancient author; yet the following seems not very distantly to bear upon it. When the duchess of Cleveland was taunted by some of her companions, that she might soon have to deplore the loss of that beauty which was then her boast, the small-pox at that time raging in London, she replied, that she had no fears about the matter; for she had had a disorder, which would prevent her from ever catching the small-pox. This was lately communicated to me by a gentleman in this county; but unfortunately he could not recollect from what author he derived his intelligence."

In the Medical Journal for March 1799, it is stated, that the cow-pox had broken out at some farms in the environs of London, about the latter end of December; and that matter had been taken for inoculation. This alludes to the commencement of the practice of vaccination by Dr. Woodville.

In the same work for the ensuing month, is a letter from Dr. Pearson, dated March 12th, in which he states, that upwards of a hundred and sixty persons had been inoculated by Dr. Woodville and himself, separately; and that none of the patients had been considered to be dangerously ill. He also observes, that so many cases of the severe kind did not occur in this practice, as usually occur in the same number of cases of the inoculated small-pox; but he nevertheless acknowledges, that although many of these patients were less indisposed, yet "the whole amount of their constitutional illness seemed to be as great, as in the same num-

ber of patients in the inoculated small-pox." He also states, that "in many of the cases, eruptions on the body appeared; some of which could not be distinguished from the small-pox."

The next article in the same publication is a letter from Mr. Lawrence, a veterinary surgeon; in which he advises us not to be very sanguine in our hopes respecting this discovery; and expresses an opinion that the cow-pox will prove only a temporary preventive of the small-pox. Hence it is evident, that he has a right to dispute the palm of priority with Dr. Moseley, who confessedly advanced the same opinion before he knew any thing of the cow-pox; and with Mr. Birch, who, as well as Dr. Moseley, boasts that he was, for a long time, the only opponent of the practice. Be this as it may, Mr. Lawrence observes, that "some of Dr. Pearson's accounts make the cow-pox a more severe disease than the inoculated small-pox;" and that "if these accounts are to be depended on, the cow-pox has already had its day."

In one respect Mr. Lawrence has proved himself a much better prophet than either of the other gentlemen in question. He says, "whatever may be the fate of cow-pox inoculation, it has given, and will give occasion to a pretty large and open discussion; which is always beneficial, as having a tendency to produce discovery, and promote improvement; and when the public ardour for the present topic shall have become a little cool and satisfied, I hope it will be turned by enlightened men towards another, perhaps of nearly as great consequence, namely, *the prevention of the original malady in the animals themselves.* Those who have witnessed, or only reflected on, the excessive filth and nastiness, which must unavoidably mix with the milk in an infected dairy of cows, and the corrupt insalubrious state of their produce in consequence, will surely join with me in that sentiment." How well this hope has been realized, and this prediction fulfilled, is evident from Dr. Jenner's account, that the cow-pox is already become so rare in Gloucestershire, where it used to be so frequent; and from its never having re-appeared in the neighbourhood of London, since the farmers there have known its origin, now a period of nine years. This is no small proof of the rectitude of Dr. Jenner's opinion, that it originates from the greafe.

In the same number of the Journal, is a communication from Dr. John Sims, containing the case of Mr. Jacobs of Brillol; who is there stated to have had the cow-pox twice, and yet to have had the small-pox afterwards in so severe a manner, that his life was despaired of. This case has since been proved by Mr. Henry Jenner, and acknowledged by Dr. Sims to have been the spurious cow-pox; and Dr. Sims, who published the account of it from the most honourable motives, is so perfectly convinced of it, that he is become one of the most zealous advocates of vaccination.

He tells us, that Mr. Jacobs described the cow-pox which he had as the most loathsome of diseases; and observes, that Dr. Jenner had entirely overlooked this circumstance, although in itself so formidable an objection to the practice, even if it should be found to answer the purpose for which it was introduced. He also remarks, that it was impossible to know how far such a disorder might prove injurious to others, as well as to the individual who submitted to inoculation.

All these unfavourable accounts of the new species of inoculation deterred numbers of medical practitioners from adopting it. But perhaps no author sounded a louder alarm on this occasion than Dr. Moseley. This gentleman boasts of his having been the first who warned parents against vaccination; and he seems determined to persist in
his

his opposition, in spite of any evidence that can possibly be advanced in its favour. Among the number of those who published adverse evidence, was also the celebrated Dr. Beddoes; the respectability of whose name added considerable weight to that side of the question. As a proof, however, that this gentleman was influenced in his conduct only by the most pure and upright motives, he has since voluntarily come forward as a zealous advocate of the practice, and pronounced the most flattering panegyric on Dr. Jenner.

Not so Dr. Moseley; he is so far from being convinced of the utility of vaccination, that he seems to be more and more exasperated against it, by every new account of its success. This, however, is not any great wonder, when he confesses that he wrote against it before he knew what it was; when he pretends that inoculation has disarmed the small-pox of its terrors; that accidents in the inoculated small-pox are uncommon, and that under proper treatment, it leaves nothing behind injurious to the constitution. After this, we cannot be surpris'd at his endeavouring to terrify parents with the idea of bestial humours; and of the ill consequences which may spring from that source, after a lapse of years.

A publication like this, although ill calculated to bear the test of criticism, was very well adapted to instil prejudices into the minds of the vulgar and ignorant; who are at all times averse from innovation in the practice of physic; and not yet reconciled to the idea of engrafting diseases. But whatever effect this publication might produce on vulgar minds, it produced much less effect on the minds of medical practitioners, and of all other learned and scientific men than some of the first reports of those, into whose hands vaccination, on its second introduction into the metropolis, happened to fall.

In addition to what is already stated, Dr. Woodville's work on this subject appeared soon after; in the dedication of which he informs sir Joseph Banks, that it *does not afford the satisfactory evidence which he expected*. It did not, indeed, afford the satisfactory evidence which others expected. Many people were of opinion, that in his account, he rather exaggerated the symptoms of those cases which had fallen under his care, in order to prevent vaccination from being established; as it tended to exterminate the small-pox, and to cut off the principal branch of his practice. This suspicion was perhaps natural when it was considered, that the cow-pox was represented by Dr. Jenner as a mild disorder, and by Dr. Woodville as a violent one; and that it was consistent with his interest to represent it as such. The truth is, that the physician of the Small-pox Hospital was the last man in the world who should have made the experiment of inoculating for the cow-pox; and the Small-pox Hospital the last place in which it ought to have been made.

By perusing Dr. Woodville's publication, any one may discover, that when he commenced vaccination, he commenced it not only in the most improper place, but also without any competent knowledge of the nature of the disease. He did not know whether it was pustular, or vesicular; general, or local; contagious, or not contagious. He also commenced it without any precaution; for he confesses, that many of his patients were in apartments where they were compelled to breathe a variolous atmosphere; and he even added to this danger of infecting them with the small-pox, that of inoculating them for the disease, at almost every period, while they were under vaccination! The consequences were such as might well be apprehended. Many of them had the small pox at the same time with the

cow-pox. In a considerable number of cases, the cow-pox and small-pox matter were mixed together, in order to gratify curiosity, and see whether it was possible to create a new disease; but happily providence has set bounds to the power of doing mischief, and frustrated such attempts. In some instances one of those diseases is said to have prevailed, and in some the other; but in none of them was any hybrid disorder produced.

Dr. Woodville tells us he sent Dr. Jenner some of his cow-pox matter; which, at first, in some instances, occasioned a trifling eruption; probably the relics of the variolous matter, with which it had been contaminated by one of the circumstances already mentioned. He tells us, Dr. Jenner attributed the pustular eruption to some peculiar influence of the town air; but he informs us, that several of his patients, in whom these pustules appeared, were inoculated at the distance of eight miles from London; and that eighteen others, at a still greater distance, were inoculated with the same matter, in all of whom it produced a similar pustular eruption. Nevertheless, he was so far from believing this eruption to be the small-pox, that he strenuously laboured to prove it was the cow-pox.

In one respect he is rather inconsistent with himself; for at page 145 he says, "the cow-pox, in every case which we are acquainted with, has been introduced into the human constitution through the medium of external local inflammation; and is therefore to be considered as an inoculated disease. The virus of it seems also to affect a similar mode of action, and to be governed by the same laws as that of the small-pox." But at page 153, after observing that the cow-pox is not infectious by effluvia, he says, "this is certainly true, when the disorder is confined to the inoculated part; but where it produces numerous pustules upon the body, the exhalations which they send forth are capable of infecting others in the same manner as the small-pox. Two instances of casual infection in this way have lately fallen under my observation. In one the disease was severe, and the eruption confluent; in the other the disease was mild, and the pustules few."

It must be allowed that Dr. Woodville, in some instances, excited the cow-pox; since he has given a very accurate description of it. He says, "if the inoculation be performed by a simple puncture, the consequent tumour, in the proportion of three times out of four, or more, assumes a form completely circular; and continues circumscribed, with its edges elevated and well defined, and its surface flat throughout every stage of the disease; while that which is produced from variolous matter either preserves a pustular form, or spreads along the skin, and becomes angulated and irregular, or disfigured with numerous vesicles."

Another distinction, still more general and decisive, is to be drawn from the contents of the cow-pox tumour; for the fluid which it forms, unless from some accidental circumstance, very rarely becomes puriform; and the scab which succeeds is of a harder texture, exhibits a smoother surface, and differs in its colour from that which is formed by the concretion of pus." So far Dr. Woodville pursues the description of the cow-pox; but suddenly he loses sight of that object, and again relapses into his former error, in the following words: "All the appearances here described, however, do not constantly attend the disease; but are sometimes so much changed, that they can in no respect be distinguished, from those which arise from the inoculation of the small-pox. When the disease thus deviates from its usual appearance, at the inoculated part, its effects on the constitution have commonly, though not always, been felt

more severely, than where the tumour was distinctly characterized."

Dr. Woodville acquaints us, that since his table was composed, an infant at the breast died on the eleventh day after the cow-pox matter had been inserted in its arm. In this case, he tells us, the local tumour was very inconsiderable; and the eruptive symptoms took place on the seventh day; when the child was attacked with fits of the spasmodic kind, which recurred at short intervals, with increased violence, and carried it off at the time above-mentioned, after an eruption of eighty or a hundred pustules."

Thus, he tells us, it appears, that out of about five hundred cases of the inoculated cow-pox, one proved fatal; while in the variolous inoculation, at the Small-pox Hospital, only one case proved fatal in six hundred. Many respectable members of the medical profession were deterred from vaccination by the foregoing statement; but it has since been proved that the child died of the small-pox.

Dr. Woodville indeed acknowledges, that vaccination in general produces much fewer pustules, and less indisposition, than the inoculation of the small-pox; but at the same time he contends, that in several instances, the cow-pox has proved a very severe disease; that in three or four cases out of five hundred, the patient had been in considerable danger, and that one child had actually died of the disorder. He confesses, that if one out of five hundred cases of cow-pox proved fatal, he should not be disposed to introduce the disease into the Inoculation Hospital; but that he is inclined to think, if matter for the vaccine inoculation were only taken from those in whom the disease appeared in a mild form, the result would be more favourable than in the statement which he had given. He says, it had occasionally happened, that matter taken from the arm of a patient, in whom the disorder neither produces fever nor eruptions, had in others produced both; yet it had much more commonly produced a milder disease, than matter taken from secondary pustules, or from a patient who had the disease in a severe manner.

He tells us, that out of sixty-two of his patients who were inoculated with the pustule matter, fifty-seven had an eruption; and that those who received the disease from any of these fifty-seven patients also had pustules in nearly the same proportion. He also informs us, that the disorder which proved fatal to one of his patients, was excited by matter of this description; that is, by matter of the *small-pox*. So far, however, was he from being aware of this, as to draw from these cases the following inference; that the cow-pock, from certain circumstances, is not only liable to lose the characters which distinguish it from the small-pox, but also to continue to propagate itself under this new and casual modification. From these erroneous premises he, therefore, draws a conclusion equally erroneous, that the small-pox and the cow-pock ought to be considered only as varieties of the same disease.

In the London Medical Review for August 1799, p. 626, Dr. Pearson expresses an opinion, that the pustules resembling the small-pox, which occurred at that time in vaccination, afforded matter, which, he believed, in some cases, produced the cow-pock in its usual mild way. This opinion, however, is not supported by any proof, and is now perfectly exploded.

In the Medical Journal for the same month, Mr. Ring published a defence of vaccination, in answer to Dr. Moseley, in which he brings forward evidence to prove, that it is much milder and safer than it had hitherto been represented to be by some London practitioners, and affirms that the success of it had, on the whole, been such as to gratify

every reasonable expectation. He also cautions medical men not to take matter for inoculation from any but an original pustule; and not to make useless experiments, or wantonly expose the lives of their fellow-creatures to unnecessary danger, by inoculating them with one kind of matter, before another had produced its final effect. This caution, unfortunately, has been too often disregarded.

He also advanced an opinion, which he has since fully confirmed in his treatise on the Cow-pox, that two morbid actions may take place in the body at the same time, notwithstanding the contrary had been maintained by Mr. John Hunter, and was considered in the schools of medicine as an unquestionable doctrine.

About the same period, Dr. Jenner published the second part of his work, entitled "Further Observations on the Variolæ Vaccinæ;" in which he tells us, that soon after the publication of the former part of his work, he clearly perceived that his theory, which promised to be so beneficial to mankind, was likely to fall into disrepute, owing to hasty conclusions. He therefore requests medical practitioners to be a little more careful in their observations, and the public to suspend their judgment till they had more ample information.

In the course of the following year, he republished these two parts of his work, together with a third, in which he says, he has the pleasure of seeing the feeble efforts of a few individuals to depreciate the practice, sinking fast into contempt.

He there observes, that upwards of six thousand persons had then been vaccinated, and that the far greater part of them had since been inoculated for the small-pox, and exposed to the infection of the disorder in every rational way that could be devised, but to no purpose.

He then alludes to the experiments of Dr. Woodville, the result of which, he observes, essentially differed from his own in a point of much importance, three-fifths of Dr. Woodville's patients having had eruptions resembling those of the small-pox. These Dr. Jenner could not ascribe to the insertion of vaccine virus, when he considered, that in his own neighbourhood, out of the great number of casual and other cases which he had seen and heard of, although the matter was derived from different sources, nothing like a variolous pustule had ever appeared. He therefore justly concluded, that those which had occurred in the practice of Dr. Woodville, and of others to whom Dr. Woodville had given matter, were occasioned by the *variolous* matter with which he had inoculated his vaccine patients, on the third or fifth day after vaccination.

In the Supplement to the Encyclopædia Britannica, under the article VARIOLÆ VACCINÆ, or COW-POX, are some erroneous, if not mischievous, opinions, which ought to be corrected. Vaccination is there represented as a more severe process than what Dr. Jenner gave us reason to expect: an eruption exactly resembling the small-pox is stated to be a very common occurrence; and in some cases the febrile symptoms are said to be considerable and alarming. In one instance it is asserted that the disorder proved fatal. It is there also stated, on the authority of Dr. Woodville, that the cow-pox is sometimes infectious by effluvia, like the small-pox, and has a similar appearance on the arm.

Dr. Woodville has since acknowledged, that the infant whose case is above referred to, died of the small-pock, and not of the cow-pock; but as there are still some persons who endeavour to prove that the cow-pock is an eruptive disease, it is necessary to enter a little further into the investigation of this point.

In the same article of the Supplement to the Encyclopædia,

dia, as well as in other publications, we are told, that from the occurrence of such pustulous eruptions, in the practice of Dr. Woodville and others, Dr. Pearson draws the following conclusions; that in certain constitutions, or under the circumstances of certain co-operating agents, *the vaccine poison produces a disease resembling the small-pox*, and of course the pustule in the inoculated part is *very different from that of the vaccine pox ordinarily occurring*, and the eruptions resemble *very much, if not exactly, some varieties of the small-pox*; that in some instances these eruptions had occurred, although the inoculated part had exhibited the genuine vaccine pustule; that the matter of such eruptive cow-pocks, whether taken from the inoculated part, or from others, universally, or at least generally, produces similar eruptive cases, and has not, as Dr. Pearson believes, been seen to go back, by passing through different constitutions, to the state in which it produces what is called the genuine vaccine disease.

In the same article it is stated, that Dr. Woodville says, if the inoculated part assumes a pustular form, though it continues only *one or two* days, the inoculation is as effectual as where it proceeds through its regular course. This, as well as the former opinion, being founded in error, the more widely it is diffused, the more necessary it is to correct it. One instance, proving its fallacy, may be seen in the Medical Journal for February, 1801, in a letter from Dr. Harrison to Sir Joseph Banks; and many others in the various authors who have written on vaccination.

Here it may not be superfluous to remark, that the term *pustule*, however common, is not expressive of the cow-pock, which is a *vesicle*, of a cellular construction.

With regard to the other opinion advanced in the Encyclopædia, namely, Dr. Pearson's, that in certain constitutions, and under certain circumstances, cow-pock matter is capable of producing a disease resembling the small-pox,—it is proper to lay before the reader such arguments and facts as may enable him to form his own judgment.

In the London Medical Review for April, 1800, Mr. Blair called the attention of the faculty to an examination of this question, and contended, that either the matter used in these inoculations was contaminated, or the cow-pox is a pustulous disease, and capable of communicating infection by effluvia. That conclusion he founded on two cases which occurred in the practice of Mr. Ring, and which Mr. Ring had related to the Medical Society. With matter taken from one of these patients Mr. Blair inoculated a child, and produced a pustular disorder, which, like the former, was not distinguishable from the small-pox, and, like the small-pox, proved infectious by effluvia; for another child in the same apartment caught the disease!

The matter which occasioned this eruptive disorder, was obtained by Mr. Ring from Dr. Pearson, and by him from Dr. Woodville; and this event furnishes one proof, out of many, of the melancholy effects of practising vaccine inoculation at the Small-pox Hospital. In the Medical Review for May, 1800, Mr. Ring observes, that the appearance of a considerable eruption, in the two cases referred to by Mr. Blair, occasioned a variety of conjectures at the time; but no one who had seen much of the practice with genuine cow-pock virus, could then possibly entertain a doubt that the matter was variolated by some means or other. Whether this contamination took its rise from a variolated lancet, or a variolated atmosphere, he does not pretend to determine, not having seen the matter, nor the lancets, till the moment when inoculation was about to be performed.

He then states, that for the space of six months he had used matter from the flock of Dr. Jenner, which had not produced pustulous eruptions, and quotes an extract of a

letter from Dr. Jenner, to prove that the cow-pock is not infectious by effluvia; adding, that even the casual disease, when most severe, has never been suspected to be capable of infecting any person, except by contact.

In the Medical Review for June, 1800, Mr. Ring states, that the opinion which he had ventured to advance in the Medical Journal for August, 1799, in opposition to the hypothesis of Mr. Hunter, and other celebrated physiologists, that two morbid actions in the same subject, at the same time, are incompatible, was then confirmed by two additional cases, published by Dr. Tracey in the New York Medical Repository; and also by a case of co-existence of the cow-pock and measles, which had lately occurred in his own practice. In this case, which he shewed to Dr. Jenner, Dr. Marshall, and other medical practitioners, the measles appeared on the eighth day of vaccination; yet the cow-pock was neither superseded nor retarded by that disease. This, and many other instances of the co-existence of eruptive disorders, which he has related in his treatise on the Cow-pox, corroborate the opinion, that the pustular eruptions in patients under vaccination at the Small-pox Hospital and elsewhere, owed their origin to the small-pox and not to the cow-pox.

In the Medical Review for July, 1800, he published some additional observations on this subject, in which he states, that he had lately seen three instances of the small-pox, in consequence of the insertion of matter obtained from the Small-pox Hospital as cow-pock matter. In the same letter he expressed his surprise, that Dr. Woodville was not yet convinced of his error. Dr. Woodville having advanced an opinion, that in those places where *the small-pox* is epidemic *the cow-pox* produces pustules, Mr. Ring observes, that where the small-pox prevails, it is more reasonable to ascribe these eruptions to the action of variolous matter, than to say, that where *the small-pox* prevails, *the cow-pox* produces pustules.

In the same publication for September, he inserted some further remarks on the same subject, in which he states, that he had since known several instances in which the small-pox was excited, instead of the cow-pock, by supposed vaccine matter procured from the Small-pox Hospital, and from Dr. Woodville; and expresses his doubt whether it was of advantage to the public, that any species of inoculation should still be practised at the Small-pox Hospital. He adds, “for my own part, I must confess, that however useful it has heretofore been in this respect, its utility ceased on the introduction of the new practice by Dr. Jenner. Either that Augæan stable ought to be cleaned, or to serve as a mere pest-house for the reception of such as are seized with the natural small-pox. It was not designed to propagate that disease, nor to disseminate a deadly poison.”

In the same paper he asserts, that when persons already infected with the small-pox are vaccinated, the cow-pock sometimes appears to mitigate, and at others to supersede the small-pox; but that this rule was not without an exception, on which account he thought much greater caution necessary in the practice of vaccine inoculation than had hitherto been observed.

In his treatise on the cow-pock, he has given a full detail of the rise and progress of vaccination in the metropolis, and an analysis of Dr. Woodville's publications; proving that the disorder which had created so much alarm, and so greatly retarded the progress of the new inoculation, was, in reality, not the cow-pock, but the *small-pox*!

§ 3. *The comparative Advantages of Vaccination.*

The following comparative statement of the advantages

of the new practice is, in a great measure, taken from Ring's Compendium of Vaccination.

The natural small-pox is a loathsome, infectious, painful, and fatal disease. It is confined to no climate; but rages in every quarter of the world, and destroys a tenth part of mankind. Those who survive the ravages of that dreadful distemper, often survive only to be the victims of other maladies; or to drag out a miserable existence worse than death. This cruel and lamentable disorder leaves behind it pits, scars, and other blemishes; and bodily deformities which embitter life.

The inoculated small-pox also is loathsome, infectious, painful, and sometimes fatal; and when partially adopted, spreads the contagion, and increases the mortality of the disease. It sometimes occasions the same maladies as the natural small-pox. It frequently leaves behind it the same blemishes and deformities as the natural small-pox; which are the more deplorable, as they were brought on by a voluntary act.

The inoculated cow-pock scarcely deserves the name of a disease. It is not infectious; and, in the opinion of the most experienced practitioners, has never proved fatal. It occasions no other disease. On the contrary, it has often been known to improve health; and to remedy those diseases under which the patient before laboured. It leaves behind no blemish, but a blessing—one of the greatest ever bestowed on man—a security against the future infection of the small-pox.

§ 4. *The Manner of taking and inserting Cow-pock Matter.*

The following instructions for the practice are also taken from Ring's Compendium. Cow-pock matter may be taken at any period, from the first appearance of the vesicle, till the areola begins to form, by small punctures; allowing it time to flow; or promoting the discharge by gentle pressure with the lancet. It must be taken with great caution; otherwise the intention of the inoculator may be frustrated, or violent inflammation and ulceration of the arm ensue.

The cow-pock matter is to be inserted, by a superficial puncture, into the middle of the arm, between the shoulder and the elbow; or, when the arm is likely to be much used, into the inside of the leg. Fluid matter is preferable to dry; but those inoculators who have not a constant succession of patients, and cannot readily procure a fresh supply of matter, should preserve it on vaccinators for future occasions. In this manner, when kept in a cool place, it may be preserved several months.

§ 5. *The Manner of preserving Cow-pock Matter.*

Cow-pock matter may be preserved, and conveyed, on the point of a vaccinator; that is, a bit of ivory, shaped like the tooth of a comb, and pointed like a lancet.

When the matter is intended to be sent to a distant place, or to be kept long, the vaccinator should be changed several times. It should not be dried before the fire; and, when suffered to dry on a lancet, should not be kept above two or three days. When dry matter is used, it should not be moistened previously to insertion; but the longer it has been kept, the longer the point of the instrument ought to remain under the cuticle, that it may have time to dissolve. When fluid matter is used, the lancet should be washed in cold water, and wiped dry after every puncture.

Various other methods have been contrived for the preservation and conveyance of cow-pock matter; but the ivory lancet, invented by Dr. de Carro, and the vaccinator above-described, invented by Mr. Ring, which is generally considered an improvement of it, being much cheaper and more

portable, are now commonly preferred. When vaccinators are to be sent to a moderate distance, they may be wrapped in paper; but when they are to be sent to a great distance, they may be inclosed in a quill, to be stopped with white wax. Sealing wax is not proper for this purpose; because it cannot be employed without heat, which is extremely prejudicial to the matter. When a vaccinator is to be used for inoculation, a small oblique puncture is first to be made with a lancet; then the point of the vaccinator is to be inserted, and held in the puncture some time, and afterwards repeatedly wiped on the part; in order to insure, if possible, the lodgment of the matter.

General Observations on the Practice.

One cow-pock is generally supposed to be a security against the future infection of the small-pox; but when the patient resides at a distance, or is in danger of catching the small-pox, it is proper to inoculate in both arms. Another reason for inoculating in both arms is, that a more copious supply of matter is thus afforded for future inoculation.

Those who have been exposed to the infection of the small-pox, ought to be inoculated with the cow-pock; which seldom fails to supersede, or mitigate, the small-pox.

§ 6. *The local Symptoms of Vaccine Inoculation.*

On the third day, the day of inoculation being reckoned the first, a red spot commonly appears; and, on the fourth or fifth, a cellular vesicle, of a light pink, sometimes with a blueish tint, gradually changing into a pearl colour. The margin is elevated, the centre depressed, the contents are limpid. It increases till the tenth day.

About the ninth, the inflammation surrounding the base spreads rapidly, and forms a circumferenced areola, which, in a day or two, commonly begins to fade. When the areola is complete, the vesicle soon begins to decline. First, it turns brown in the centre; it is then gradually converted into a hard, smooth, shining scab, of a dark mahogany colour, approaching to black; which falls off about the end of the third week, leaving a scar, which is generally round and circumferenced, and some degree of indentation.

§ 7. *Spurious Pustules.*

A spurious pustule is more elevated and opaque than the genuine; and more rapid in its progress. It is not cellular; nor surrounded with a distinct circumferenced areola; nor converted into a dark shining scab. Spurious pustules often occur in those who are vaccinated after having had the small-pox. They are sometimes also produced in those who have not had the small-pox, by blunt or rusty lancets, by matter taken from a spurious pustule, or from a genuine pustule at too late a period; or by that which has been kept too long, or dried before the fire. When there is any irregularity, or doubt of success, the patient ought to be inoculated again.

§ 8. *The constitutional Symptoms.*

Sometimes a drowsiness appears on the second or third day of vaccination. Febrile symptoms also sometimes commence early; but more frequently about the eighth day. They are commonly slight and transient. In many cases there is no apparent constitutional indisposition; yet the patients are rendered secure from the future infection of the small-pox.

The superiority of vaccine inoculation being now fully ascertained, some restriction ought to be imposed on the inoculation of the small-pox; and those mercenary practitioners who prefer their own private interest to that of the

public, should no longer be suffered to disseminate a malignant poison, or to scatter the seeds of death with impunity.

§ 9. *Prejudices against Vaccination.*

The prejudices against vaccination are similar to those which formerly prevailed against the inoculation of the small-pox. They proceed partly from ignorance; but self-interest has also a considerable share in exciting them, as is too evident in the conduct of certain individuals, who wish to profit by the credulity of the public, and to enrich themselves by the inoculation of the small-pox.

One of the prejudices against vaccination is, that it produces other diseases; another, that it is no security against the future infection of the small-pox. With respect to the first, it may perhaps be sufficient to observe, that no such diseases are produced by the cow-pox in the casual way, though much more severe than under inoculation, nor in the children of persons in a respectable situation of life. Those which are ascribed to this cause occur chiefly in the children of the lower class; and are occasioned by want of care, and of cleanliness or other causes to which the poor are, in all countries, in some measure, unavoidably exposed.

These disorders, which used to be concealed as much as possible by parents, and other parties concerned, have lately been dragged into light; and accounts of them have been circulated with great industry, and with the most shameful exaggeration and misrepresentation. It has, however, been proved, that they are less frequent than they were before vaccination was introduced into practice; and that even in Gloucestershire, where the natural cow-pox has been most known, and best understood, no person has ever applied to the Infirmary for any disease, supposed to be occasioned by the cow-pox.

We shall conclude this article with an extract from the Report of the Royal Jennerian Society for the Extirpation of the Small-pox, dated October 1, 1807.

"The Directors congratulate the public on the very favourable opinion which the Royal College of Physicians of London, after a most minute and laborious investigation, made by command of his majesty, have a second time expressed on the subject of vaccination, in their Report laid before the house of commons, in the last session of parliament; in consequence of which the sum of twenty thousand pounds was voted to Dr. Jenner, as a remuneration for his discovery, in addition to ten thousand pounds before granted.

"In this Report, the college of physicians, after premising that they advance nothing but what is supported by multiplied and unequivocal evidence, assert, that the testimonies before them are decided in declaring, that the cow-pox is much milder, safer, and much less apt to cause other diseases than the small-pox: that the monstrous diseases attributed to vaccination, are either the inventions of designing, or the mistakes of ignorant, men; and that the prints and publications which have been so widely circulated, in order to alarm timorous and uninformed parents, originate either in gross ignorance or wilful misrepresentation.

"They are also of opinion, that if due encouragement were given to vaccination,—if the public were fully informed of its advantages, and the benefits of this salutary operation were every where offered to the poor free of expence, it would in time supersede the inoculation of the small-pox. One particular advantage of the cow-pox is, that it protects those individuals who submit to the operation, without endangering the health of the community at large; whereas the inoculation of the small-pox keeps up a continual source of contagion, and increases the fatality of the disease."

In fine, the college of physicians declare, "that they feel it their duty strongly to recommend the practice of vaccination; that they have been led to this conclusion by no preconceived opinion, but by the most unbiassed judgment, formed from an irresistible weight of evidence which has been laid before them; and that when the number, the respectability, the disinterestedness, and the extensive experience of its advocates, are compared with the feeble and imperfect testimonies of its few opposers,—and when it is considered that many who were once adverse to vaccination have been convinced by further trials, and are now to be ranked among its warmest supporters, the truth seems to be established as firmly as the nature of such a question admits; so that the College of Physicians conceive that the public may reasonably look forward with some degree of hope to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages, at least, if not to the existence of the small-pox."

"It is highly satisfactory to observe, that these opinions of the royal college of physicians of London are supported by the concurrent testimony of the other colleges of physicians and surgeons in the United Kingdom.

"The Royal Jennerian Society, aware of the necessity of using their utmost exertions for accomplishing the great object of their institution, continue to offer gratuitous vaccination to all descriptions of persons, at their Central-house, No. 14, Salisbury-square, Fleet-street, and at their other stations in different parts of the metropolis: as well as to afford their utmost assistance in extending its benefits, by the distribution of vaccine matter, with proper instructions, and by all other means in their power: and, they trust, a generous public will enable them further to promote a practice, which is so essential to the prosperity of the British empire, and to the welfare and happiness of mankind."

We refer those who wish for further information on this important subject, to Dr. Jenner's Inquiry into the Causes and Effects of the Variolæ Vaccinæ, or Cow-pox; Dr. Pearson's Inquiry concerning the History of the Cow-pox; Dr. Woodville's Reports on Vaccine Inoculation; Dr. Willan on Vaccine Inoculation; the Evidence at large, by the Rev. George Jenner; Practical Observations on the Inoculation of the Cow-pox, by Mr. Bryce, member of the Royal College of Surgeons of Edinburgh; the London Medical Review; the Medical and Physical Journal. Also, A Treatise on the Cow-pox, 2 vols. with plates; a Compendium of Vaccination; an Answer to Mr. Goldson; an Answer to Dr. Moseley; an Answer to Mr. Birch; and A Rowland for an Oliver, containing an Answer to Dr. Moseley and Mr. Birch, by Mr. Ring, member of the Royal College of Surgeons of London, to whom we are indebted for this article.

COWRING, in *Falconry*, the quivering of young hawks, who shake their wings, in sign of obedience to the old ones.

COWRY, or KOWRY, in *Commerce*, a small shell used in Hindoostan, particularly at Calcutta, as a small coin, and brought from the Maldives in exchange for rice. Cowries are also used as current coin in Africa. It is said that about 100 tons of cowries are annually shipped from England alone to Guinea. These are originally imported from the Maldive islands to Bengal, and from Bengal into England. In Bengal 80 cowries make a *poni*, and 60 or 65 ponies, as there are few or many cowries in the country, make a rupee. There is, however, a great variation in the value of cowries in Bengal. Ricaud says, that 2560 make a rupee; Bolts says, 4000 to 4800 are of the same value; and Stavorus makes a rupee equal to 4800, and as high

as 5000. Others say, that in Bengal 2400, more or less, are equal to a shilling; and yet, notwithstanding the incredible smallness of the denomination, some articles in the market may be purchased for a single cowry. In the inland parts of Africa, they are about ten times as dear, varying from 220 to 280. Mr. Beaufoy was told that in Kaffan they were at the rate of about 250. Mr. Park reports that they are about the same price at Segoo, but cheaper at Tombuctoo, which is about the centre of the cowry country; dearer towards Manding, which is the western extremity of it. Hence they are probably carried in the first instance to Tombuctoo, the gold market, and thence distributed to the East and West. Their circulation seems to be confined between Bornou, where they have a coinage of base metal, and Manding.

COWSLIP, in *Botany*. See *PRIMULA veris*.

COWSLIP, *Virginian*. See *DODECATHEON*.

COWTENS, in *Geography*, a place of America, in S. Carolina, between Pacolet river, and the head branch of Broad river, where general Morgan gained a considerable victory over lieut. col. Tarleton, Jan. 11, 1781.

COX, RICHARD, in *Biography*, a learned prelate, was born of mean parents in Buckinghamshire, in the year 1499. He received his grammatical instructions at Eton; from thence he obtained a scholarship in King's college, Cambridge, of which he was afterwards a fellow; and, in the same year, 1519, he took his degree of B. A. From Cambridge, at the invitation of cardinal Wolsey, he went to Oxford, where he was appointed a junior canon of Cardinal college, and admitted to the same degree as he had before taken at Cambridge. In 1526, having performed with much credit his regular exercises, he proceeded to the degree of M. A. He was now greatly distinguished, as well for his moral conduct, as for diligence and assiduity as a student; but his zeal for the opinions of Luther, and his desire of extending the limits of the reformation, rendered him obnoxious to his superiors, who stripped him of his preferment, and threw him into prison. Here, however, he was not long confined; and, upon his release, he was chosen master of Eton school, over which he presided with great credit and usefulness. Through the interest of archbishop Cranmer he was raised to several important stations in the church, and was appointed preceptor to prince Edward; on whose accession to the throne, he was sworn of the privy council, made king's almoner, and appointed chancellor of Oxford, canon of Windfor, and dean of Westminster. In some of these stations his great zeal for the reformation led him to destroy a number of curious and valuable books, for no other reason than to shew his hatred to the catholic cause, by the abettors of which they had been written. On the accession of queen Mary, religious zeal and bigotry were turned against him. His preferments were seized, and himself once more imprisoned; but he fortunately obtained a speedy release, of which he took advantage, and left the kingdom. At Strasburg, whither he went, he was permitted, with others of his countrymen, to exercise public worship according to the forms established in the reign of Edward VI. On the death of the queen, who, on account of the cruelties and murders which disgraced her reign, has justly obtained the title of bloody Mary, Cox returned to England, and, with other divines, was appointed to revise the liturgy. He was elevated to the see of Ely, which he continued to enjoy upwards of twenty years. His strenuous opposition to certain relics of popery, upon which he often preached, and his defence of the marriage of the clergy, prevented him from rising very high in Elizabeth's esteem. She even, in the latter years of the bishop's life, alienated from him, much of the property belonging to his see. He

resisted this stretch of royal authority, but the arm with which he contended was too powerful for him, and he was eventually forced to propose resigning his bishopric, and to retire upon a small pension. There was, however, too much virtue in his brethren to induce any one to accept of his benefice on such ignominious conditions. Dr. Cox, therefore, continued in his office till death deprived him of the honours, and released him from all the vexations of life. He died at the age of 81, in the year 1581, leaving behind him a character for great learning and integrity; but he was a severe enemy to those who differed from him, and the persecutor of papists and puritans. He was author of many works of considerable estimation on theological subjects; and was principally concerned in the compilation of the Liturgy of the Church of England: he translated the Gospels and Acts of the Apostles, and the Epistle to the Romans, in the new translation of the Bible in the reign of queen Elizabeth, and is supposed to have been concerned in the composition of Lily's Grammar. Some of his letters to the queen are to be found in Strype's Annals of the Reformation.

COX, RICHARD, distinguished as lord chancellor of Ireland, and historian of that country, was born at Bandon, in the county of Cork, in 1650. By the death of his father, the care of his education devolved upon an uncle, who put him first to a country grammar-school, and afterwards articulated him to an attorney, a profession which he followed till he obtained as much money as was sufficient to enter his name on the books of Gray's Inn, with a view of being called to the bar. Having attained his object, he returned to Ireland, married, and commenced farmer. In this line he continued about seven years, when he was called into activity as a lawyer. Under the patronage of sir Robert Southwell he was appointed recorder of Kinsale in 1680; but the zeal which he at all times exhibited in defence of protestantism, rendered his abode in Ireland unsafe. He accordingly withdrew to England, and settled at Bristol, where he wrote his History of Ireland, which was published in 1689. Previously to this, he had made himself known by a smaller work, to shew the necessity of calling the prince of Orange to the throne of these realms, and of sending an effective force to Ireland. Early in the reign of the illustrious William he accompanied his friend sir Robert Southwell to Ireland, in the quality of secretary: his services in this station were rewarded by a justiceship in the common pleas, and by being made military governor of the city and county of Cork. His conduct in this station has been censured on account of the rigour which he exercised upon the natives, whom he treated as a conquered and hostile people. His severity was tempered with justice, though not softened by clemency: he insisted upon the faithful observance of the Articles of Limerick, which many protestants opposed, as being too favourable to the catholics. It is to his honour that he gave up his employments, rather than his integrity, in this particular; which were not restored to him till the year 1701. His advice was sought by the ministers of queen Anne, who, in 1703, raised him to the office of lord chancellor of Ireland, which he filled with much credit, during four years, when, being dismissed, he retired into the country, and spent his time in the improvement of his estate, and in the study of divinity, to which he was much attached. From the country he was called to the post of chief justice of the queen's bench in Ireland; but on the accession of George I. he was removed from the bench, and from his seat in the privy council, and fell under the censure of the house of commons, on account of his too great attachment to the power of the crown. He now withdrew from public life, and, in 1733, he died at the age of 83.

His principal work as an author was "Hibernia Anglicana; or, the History of Ireland, from the Conquest thereof by the English, to the present Time." Biog. Brit.

COX'S, in *Geography*, a town of America, in the state of Virginia, 152 miles W.S.W. of Philadelphia.

COXÆ, or COXENDICIS, *ossa*, in *Anatomy*, are terms applied to the ossa innominata.

COXAMARGUILLA, in *Geography*. See CAXAMARGUILLA.

COXCIE, MICHAEL, in *Biography*, an eminent painter, born at Mechlin, in the year 1497. At a very early age, he was placed under the tuition of Bernard Van Orley, from whose instructions he derived considerable benefit; but it was in Rome, from the lessons of the divine Raffaele, and from contemplating and copying his productions, that our young artist caught a ray of the excellence of that great master. He sojourned many years in Rome, where he married. The reputation of his abilities occasioned his being employed, upon his return to Flanders, in decorating many of its principal churches, where several of his pictures, evincing no small degree of merit, still remain. Many of his other productions, during the war with Spain, were carried to that country, where they are held in high estimation.

But however great the reputation Coxcie enjoyed through life, and however generally his pictures have been esteemed since his death, he yet has not escaped censure; and he is accused of having too frequently availed himself of the studies which he made from Raffaele, by introducing the figures of that great master into his own compositions.

Towards the close of his life, having become very rich, he built three houses in Malines, which he furnished with his own performances. His pictures, though from the length of his life, and his incessant application, very numerous, are yet rarely to be met with. Coxcie was killed by a fall from a scaffold in 1592, in the town-hall of Antwerp, where he was painting, at the very advanced age of 95 years.

We shall only notice the following works of this artist. In the church of Notre Dame at Antwerp, is a "Holy Family" by him, which frequently excited the admiration of Rubens; and in the same church he painted a "St. Sebastian," a "Crucifix," and several portraits, just imitations of nature, and highly expressive.

If, as Vafari has affirmed, Coxcie was the inventor of those beautiful compositions of the story of Cupid and Psyche, engraved in 32 plates, by the school of Marcantonio, the greatest eulogiums would be due to him, as the author of some of the most exquisite productions of the art. The style of Raffaele, however, in these prints, appears so evident, that we can scarcely hesitate to pronounce, that upon this occasion, as on some others, the Florentine biographer has been misinformed. Descamps. Vafari.

COXHALL, in *Geography*, a township of America, in the county of York, and district of Maine, containing 775 inhabitants.

COXILITLI, in *Ornithology*, the *CRAX rubra* of Gmelin; which see.

COXSAKIE, in *Geography*, a township of America, in the western part of Albany county, and state of New York, containing 3406 inhabitants; of whom 302 are slaves, and 613 electors.

COXSWAIN, on board a ship. See COEKSWAIN.

COXWYCK, in *Geography*, a town of Norway, 44 miles N.N.E. of Romsdal.

COYA, or COYBA, a venomous insect in South America, of a fiery red colour, and about the size of a bug. The poisonous juices of this insect, when burst upon the skin of any animal, are often fatal. However, the Indians have an antidote against it, in the dried stems of an herb.

COYAMATL, or QUAAUKINYAMATL of Fernandez, in *Zoology*, the rajacu of Marcgrave, and the *pecari* of Buffon, the Mexican hog of Pennant, and *Sus Tujassu* of Gmelin; which see.

COYAU, in *Geography*, a settlement of America, on the river Tennessee; 30 miles below Knoxville.

COYDALLA, in *Ancient Geography*, a town of Asia Minor, placed by Ptolemy in the interior of Lycia.

COYEGEM, in *Geography*, a town of Flanders, $1\frac{1}{2}$ league from Fuines.

COYLAN, a river of Hindoostan, which rises 20 miles N. from Chuta Nagpour, in the province of Bahar, and joins the Soauk, 34 miles S. of Conjour; by their junction they form the Bramuce.

COYLAN, or QUILON, a Dutch factory, now in the hands of the English, about 14 geographical miles to the N.N.W. or N.W. of Anjenga. Along the whole coast from Coylan in N. lat. $8^{\circ} 51'$, to Cranganore, in N. lat. $10^{\circ} 23'$, there is a vast assemblage of lakes, that extend in some places 30 miles inland, and are the repositories of the waters which spring from the west side of the Gants:—the whole country here being very flat, marshy, and unwholesome.

COYOLCOS, in *Ornithology*, the coyolcozque of Hernandez, Ray, &c. the lesser Mexican quail of Latham, is a species of TETRAO (which see), in the system of Gmelin.

COYOLTOTOTL of Fernandez, the red cotinga of Cayenne of Buffon, the red chattering of Latham, the red bird from Surinam of Edwards, and *AMPELIS carnifex* of Gmelin; the specific character of which is, that it is red, with its ocular band, and tips of the quills of the wings and tail black. It is found in New Spain, Guiana, Cayenne, and Surinam. It is about eight inches long. See COTINGA.

COYPEL, NOEL, in *Biography*, a French painter of considerable eminence, born in Normandy in 1628. Guyon Coypel, an artist of no note, the father of Noel, perceiving his son's predilection for the pencil, placed him under the tuition of a painter named Poncet, the disciple of Vouet. He soon, however, quitted his master, and, at the age of fourteen years, went to Paris. There accident made him known to Quillier, who, admiring the boy's talent, took him under his care.

He remained some time with Quillier, and so rapid was his progress, that he was shortly afterwards employed at Versailles, under Charles Errard, and was thought worthy of receiving a stipend equal to that of other more experienced professors.

In 1668 he was made a member of the royal academy at Paris, and a few years afterwards was by Louis XIV. appointed director of the French academy at Rome, which station he filled several years, with credit to himself, and great benefit to the students over whom he presided. He returned to Paris, where he enjoyed the favour of the king until his death, which happened in the year 1709.

Coypel's works denote considerable fecundity of invention, and although of a style decidedly French, possess expression joined to sufficient correctness of design, and a good tone of colouring.

His performances are very numerous. In the church de Notre Dame at Paris is a picture from the pencil of Noel, representing St. James the Greater converting a Gentile at the place of his execution. He also painted Cain killing Abel in one of the halls of the royal academy, and a Trinity and an Assumption in the church of Invalids. He is said to have etched two or three plates in aquafortis. *Extrait des differens Ouvrages, &c.* Huber.

COYPEL, ANTOINE, the son of Noel, born at Paris

in 1661, accompanied his father to Rome, and though only eleven years of age, studied in that city the works of Raffaele, Michelangiolo, and Annibale Caracci, with such benefit that he shortly afterwards became a successful candidate at a public concurrence of the young artists of the academy, and bore away the prize. He then undertook a journey to Lombardy, to contemplate the master-pieces of Correggio, Titian, and Paul Veronese.

Upon his return to Paris, he displayed evident proofs of his possessing no inconsiderable degree of talent. At the age of 20 years he was made a member of the royal academy, and was afterwards appointed principal painter to Monsieur the king's brother. The duke de Chartres was also particularly partial to our artist, for learning that advantageous overtures had been made to induce him to go to England, this prince visited him incognito, and prevailed on him to remain in his native country.

Having painted the middle of the vault in the royal chapel at Versailles, the king, to recompense the ability he had shewn in that work, appointed Antoine his principal painter, and granted him letters of nobility. In 1707 he was made professor of the royal academy, and in 1714 he became director.

One of his last works is the grand gallery of the palais royal, in which he has represented the principal actions of the *Aeneid*. His intense application to this and his other performances, and the fatigue he underwent, threw him into a sickness which terminated his life in 1722.

Few painters have better understood the poetry of the art, or have been better instructed in history and fable, than Antoine Coypel; and his works, though they shew the mannerist, possess great spirit. He made Rubens his model for colouring, and he succeeded in giving althrough though sometimes an exaggerated expression to his figures. Two of his best pictures are in the church de Nôtre Dame; one representing Christ disputing with the Doctors, the other the Assumption of the Virgin. The halls of the academy, the chapel at Versailles, and many churches in Paris, also contain the productions of this artist. He engraved with his own hand several plates which are enumerated by Heinecken. *Extrait des differens Ouvrages.* Heinecken.

COYPEL, NOEL NICOLAS, was also the son of Noël Coypel, and born at Paris in 1692. He had only the benefit of his father's instructions until he was 15 years old, but he compensated for the loss he sustained by his assiduity in studying the ancient statues and other works which might contribute to his advancement. In the year 1720 Noël Nicolas was admitted a member of the royal academy, and thirteen years afterwards was made professor. He died in 1735.

The churches des Minimes at the palace royale, possess one of his best performances. It represents S. François de Paul, with his companions, passing the sea, supported only by his mantle. We have a few etchings by this master, one of which represents the triumph of Amphitrite; another a Sleeping Nymph surprised by a Satyr. *Extrait des differens Ouvrages.* Heinecken.

COYPEL, CHARLES ANTOINE, the son of Antoine, was born at Paris in the year 1694. He was made member of the royal academy in 1716. In 1720 he was created professor, and afterwards director of that institution. He died in 1752.

One of his principal works is a large picture in the church of *Les Peres de l'Oratoire*, in the *rue d'Enfer*. It represents Christ before Pilate, and is described as an extensive and magnificent composition. He likewise was employed upon many works from fable and profane history, for the tapestries of the gobelins. Like others of his family he sometimes

amused himself with engraving. His productions in this way are enumerated by M. Heinecken. *Extrait, &c.* Heinecken.

COYPUS, in *Zoology*, a species of mouse, found in Chili. See *Mus Coypus*.

COYZEVOX, ANTOINE, an able sculptor of Spanish extraction, born at Lyons in 1640. At the age of 17 he went to Paris, where, after having wrought several years under the most eminent sculptors of that city, he was employed upon many works by cardinal de Furstenburgh, and afterwards conducted by him into Germany. Upon his return to Paris he chiselled many statues for Louis XIV. for the royal gardens at Versailles and Marli, and amongst other productions, executed the bronze statues of that monarch, both on foot and on horseback. He was some time director of the academy. Oriandi.

COZCAQUAUHTLI, in *Ornithology*, king of the vultures of Edwards, and *Vultur Papa* of Gmelin, which see.

COZES, in *Geography*, a small town of France, in the department of the Lower Charente, 5 miles S.W. of Saintes, and in the district of that name. It has 1889 inhabitants, and is the chief place of a canton which in fifteen communes, and upon a territorial extent of 222 kilometres and a half, comprizes a population of 12,335 individuals.

COZOLA, in *Ancient Geography*, a town of Asia, in Greater Armenia. Ptolemy.

COZTIQCOTEQUALLIN of Fernandez, in *Zoology*, the coquellin of Buffon, varied squirrel of Pennant, and *Sciurus variegatus* of Gmelin; which see.

COZUMEL, in *Geography*, an island of North America, near the east coast of Yucatan, inhabited by native Indians; the country is fertile, and abundant in fowl and cattle; 40 miles long, and from 3 to 10 wide. N. lat. 19° 40' W. long. 85° 51'.

COZZA, FRANCESCO, in *Biography*, an historical painter, born in Palermo in 1605. He was one of the scholars of Domenichino, and after the death of that great master, was employed, with others of his scholars, to complete some of his unfinished works. Although this circumstance evinces him to have been an artist of considerable merit, we do not find that he attained any great eminence. He died in 1682.

One of his best works is a madonna in the church of S. Francesca at Rome, where he chiefly resided. Lanzi.

COZZA, GIAMBATISTA, an historical painter, born at Milan in 1676. At an early period he domiciliated himself at Ferrara, where he enjoyed considerable reputation until his death, which happened in 1742. His works are numerous in the churches and convents of that city. Lanzi.

COZZANO, in *Geography*, a town of the island of Corsica; 21 miles E. of Ajaccio.

CRAANEU, THEODORE, in *Biography*, an eminent physician and teacher of medicine, flourished in the middle, and latter part of the seventeenth century. After practising some years at Nimeguen, he went to Leyden, where he was appointed one of the professors in medicine, and physician, and Aulic counsellor to Frederic William, elector of Brandenburg, an honour which he continued to enjoy to the time of his death, which happened March 27th 1688. His works, which were numerous, were collected together a year after his death, and published at Leyden, in two volumes 4to. The principal of them, "Lumen Rationale Medicum," afterwards entitled, "Tractatus Pysico-Medicus de homine, tabulis aeneis illustratus;" has been frequently reprinted, and

and contains among such that cannot be commended, some useful observations. There is a good delineation of the thoracic duct, but his anatomical figures are in general far from being correct. "His zeal for the Cartesian system, Haller observes, to which he made his physiology bend, led him into great errors;" and even those parts of his work, which gained him most credit, have been superseded by the labours of later anatomists.

CRAB, in *Zoology*. See CANCER, and CANCER *Parvus*.

CRAB, in *Commerce and Domestic Economy*, is particularly applicable to the *cancer menas* of Linnæus. An account of this species will be found under the article CANCER; but as it is the only one of the genus which is used as food in Europe, it requires a more particular discussion than properly belonged to our scientific arrangement.

Of the various modes of catching crabs the most simple is that of searching under the stones of a rocky beach at the time of low-water. Numbers are thus found in the crevices of the stones. When the stones are small they are removed, but where they are large, a stick, with a hook fastened to its extremity, is thrust into the holes or crevices, to which the crab fastens, and is then pulled out. This, however, is practised only on a small scale, and generally by private persons for their own use or amusement. Large crabs are seldom to be procured by this method, the weaker only being more readily left behind by the tide.

On the coasts of Northumberland, Durham, and Yorkshire, those parts of the shore which the crabs frequent are generally skirted with rocks, in which are many small cavities. Near the entrance of these holes the fishermen place a bait formed of the entrails and heads of fishes. To this garbage they attach a stone by means of a cord or string. The animals, when the water flows, come to these places, drag the bait into their holes, and the stone, which is drawn with it, closes the entrance, and prevents them from making their escape. When the water falls, the fishermen remove the stones, and, by means of an iron hook fastened to a stick above 3 or 4 feet long, they draw out the crabs from these recesses. The crabs are able to drag these stones by the assistance of the buoyant power of the water; but when left dry, by the ebbing of the tide, the stones without that assistance are too weighty for the efforts of the crabs to be able to remove them.

Notwithstanding the apparent simplicity of this method for catching these animals, it presents a curious instance of the application of gravity, as varying in different media; and we doubt not but the principle might be extended, in many cases, as an useful mechanical power. It is necessary that the stone be large enough to stop the hole sufficiently to prevent the exit of the crab, and, at the same time, light enough to be dragged by him with the string. By the construction of his body and claws he will be able to pull what he could by no means push along, so that the stone may be lighter than what at first sight might be imagined. Of all this, experience has taught the fisherman to judge.

From Berwick-upon-Tweed northwards, as far as Aberdeen, wherever the shore affords a situation favourable to these animals, they are caught in a sort of basket or trap called a *cruive*, or *creel*. See Plate III. *Miscellany*, fig. 6. These creels are generally about five feet long and two feet wide, and nearly of a cylindrical form, cutting off a transverse section to form the base. They are made with slips of thin wood or deal for the bottom, and of wooden hoops for the curve, over which is woven a strong

net. From each end the net-work is wrought inwards into a narrow entrance, something similar to the plan of a common wire trap for rats or mice. A bait, made of such garbage as before mentioned, is suspended within about the middle of the trap, that it may be visible to the crabs and entice them into the snare. The whole of this apparatus is then sunk in the water by means of a large flat stone, which is fastened to its bottom. A rope of sufficient length is tied to the top, by which it can be lifted up; and by a buoy or float made of cork, and fixed to this rope, the fishermen are directed to the spot where the *cruive* is placed. The crab enters, falls down, and cannot get out again on account of the entrance projecting over his head. The cost of one of these *creels* is from eight to ten shillings. In warm weather the fishermen drop them near the shore, in from three to five fathoms water. In cold weather the crabs go further off for deeper and consequently warmer water, but they are always on rocky ground.

As an article of commerce crabs are sometimes brought from Norway, along with lobsters in vessels particularly adapted to the purpose. On the rocky coasts of that country they are extremely abundant. As a domestic source of wealth in Great Britain, the catching and sale of these animals furnish a share of employment and support to numerous industrious families. It is joined with the general trade of a fisherman, who drops his *creels*, leaves them, and rows farther out to sea for other fish. From twelve at night, in summer, to several hours into morning, the fisherman goes out to sea, lays his line at dawn, which is the best time for the fishing, at slack of ebb or flow, when the current of tide does not impede, and returns with his catch; then he draws his *creels* for shell-fish.

The price of crabs on the different coasts varies with the success of the fishing. In the north of Scotland they are seldom above twopence, and are usually as low as a half-penny a-piece. In England they vary from threepence to three shillings.

The sexes are denominated in England the *cock* and the *hen crab*. In Scotland they are known by the names of *earl* and *queen*, or *quin*, *partons*. The common crab, of which we now treat, is always termed by the Scotch a *parton*. All the other species of cancer, except the lobster, are called crabs. The sexes are easily distinguished from the flap, flag, or apron, which is upon the breast of both. That on the female is large, broad, and loose, and, when the animal is alive, is easily opened. That of the male is much smaller and narrower, in proportion to his size, and is opened with considerable difficulty. Under the flap of the male are discovered two thread-like appendances, and below that of the female are two orifices. If the rims of these orifices appear full and plump, the fish may be safely pronounced fresh food; but if they be shrivelled, fallen, or sunk, it proves that the crab has been some time dead, and, when dressed, will be stale and watery. The male has a bigger body and larger claws, and is, therefore, of greater value than the female; the earl selling generally two-thirds higher than the queen.

The quality of the crab, before boiling, is also discovered by its outward appearance. Those that have a considerable degree of roughness, particularly on the claws, are good; while the bad ones are known by their clear, smooth, and watery-looking shell. The shell of a good one is of a dusky-red colour. In chusing them, it is also proper to observe, that such as have small bodies, in proportion to their claws, are generally best: provided that the crab be offered to the purchaser alive, or rather, unboiled. When boiled, it is almost impossible to be deceived. After picking out the heaviest,

heaviest, hold all the claws tight, so that they shall make no noise or rattle. Shake it, and if it jumbles, or sounds as if there were water in it, it is certainly bad; but if good there will be no perceptible motion in the inside.

Crabs are brought to market either raw or boiled, according to the distance, or the known preference of the buyers to one state rather than the other. Much has been said of the cruelty of the fishers, who endeavour to carry their crabs alive to a distant market, by which they are allowed to linger out life for several days, under the tortures of hunger and suffocation, to which many fall victims. The fact is, that the fisher, in the routine of his trade, seldom reflects on the distinction between cruelty and humanity. Like the far greater part of mankind, he is actuated solely by feelings of pecuniary interest, and accommodates his practice to the pleasure of his customers. That the fish be fresh, or newly caught, is a general recommendation; and the purchasers, in most places, prefer using their own judgment in this respect, by examining the horrid mass of destruction, and separating the dying from the dead.

The crab is peculiarly tenacious of life, and is capable of exerting a considerable degree of muscular force after it has been two days removed from its natural element. The writer of this once saw a crab in that situation, who accidentally got hold of the tip of the tail of a grey-hound, and was dragged to a considerable distance on the street by the dog, who, howling with pain, was unable to get rid of the convulsive grasp of his unwelcome parasite, till the crab was literally dashed to pieces on the pavement.

The crab is often dead to outward appearance when connoisseurs can satisfy themselves that it is yet alive, and still fitted for one of the luxuries of the table. They raise up its apron, and if any spark of life remain it will be exhibited in the exertions of the creature, with its claws, to keep the apron closed, and its degree of life is estimated from its activity in that respect.

Crabs are in season from eight to nine months in the year; May, June, and July being the only months in which they are not so. The months here specified are, however, generally, and not individually, applicable; the age, size, and sex of the crab causing a variation of a month sooner or later. Some are even good through the whole year.

The length of time during which crabs are boiled is exceedingly different in England from what it is in Scotland; and follows, in that respect, the distinguishing rules of cookery generally observed in these divisions of the island. The time is counted from the moment the water begins to boil, whether the crabs be put in the water just then or previously. In England they are boiled only fifteen minutes; whereas, in Scotland, they are often kept boiling nearly two hours. Sea water is preferred for boiling these, and indeed all other fish; and where that cannot be procured, a quantity of salt is put into the kettle equivalent to a table spoonful for each crab. It is, perhaps, owing to the length of the time of boiling, that the Scotch, in general, prefer the claws to the body of the parson. The claws are less liable to be injured by overboiling, while the body, taken from the Scotch kettles, is reduced to a dry mash or pulp, and would be reckoned perfectly useless on the table of an Englishman; though, when properly boiled, he generally prefers it to the claws. On the contrary, it is common on the coast between Dundee and Aberdeen, and more particularly at the town of Perth, to eat the large claws only and to throw the others, along with the body, to the dung-hill.

It is well known that the change which the animal fibre has sustained when it is said to be *sufficiently done*, or boiled, may be produced in a lower heat than 212 degrees, or that of boiling water. In many kinds of fish, good cooks are

careful to keep the water below the boiling point, at least at the commencement of the operation. It may be on this account that crabs are supposed to be *better done* when they are put into the water while cold, and suffered to expire in torments gradually increased with the heat, than if they were plunged at once into the boiling fluid. Other causes have combined to induce this cruel practice. Crabs, as well as lobsters, are apt to throw off their claws on the sudden stimulus of extraordinary fright or pain; and the body thus separated from its members, is supposed to furnish a less pleasing object on the table of the epicure, and less to display the attention of the cook. However these things may be, it were certainly a praise-worthy inquiry to endeavour to discover, for these ill-fated animals, the shortest road to death, which might, at the same time, be consistent with that delicacy of flavour and seamliness of appearance which their tyrants and murderers, by boiling them alive, so imperiously require.

In the boiling of lobsters, in particular, a curious change takes place in the colour of their shells. Naturally they possess a colour approaching to black; on a nearer examination, it appears of a deep purple; the colouring matter, in many parts, is too thick to admit the passage of the light to the shell and back again; where it is thinner, it constantly appears like a blue film. This is turned into a pale red by boiling, which is thus accounted for: the colour is merely superficial; it is spread over the white calcareous earth of which the shell is composed; scraping or filing will entirely remove it; the action of boiling water does this in part. It effects also another change; it alters the capacities and form of the pores of the shell. By the first operation, the rays of light, which were absorbed in the dark colour, become reflected; and by the second the colouring matter obtains the power of reflecting red rays rather than any other.

We have already mentioned the mode of distinguishing the sexes from the two thread-like apertures of the male, and the two corresponding orifices of the female. Their intercourse is accomplished, by the females lying on their backs, and receiving the two filiform appendages of the male into her two orifices, or *vulva*. What time elapses between this and the exclusion of the ova we have not been able exactly to ascertain; but when that period arrives, the spawn, or ova, are exuded through the two orifices, and are often so abundant as to raise the flap an inch and a half or two inches from the shell. During this operation the female is much weakened, and rendered totally unfit for the market.

It is among such animals alone, as thus possess double organs of generation, that true hermaphrodites can be found. The author of this article recollects seeing, in one of the periodical publications of this country, a drawing of a lobster, on which, a line being continued down the middle of the body, from the head to the tail, one side exhibited all the marks of the male, while the other as completely displayed those of the female, not only in their more peculiar sexual distinctions, but also in the shape of the scales and the size of each division of the body, as well as of the claws. See article LOBSTER. Nicholson's Journal for 1806, article *Scotch FISHERIES*.

CRAB, in *Mechanics*, an engine used for mounting guns on their carriages. See GIN.

CRAB, in *Sea-Language*, a wooden pillar, whose lower end is let down through the ship's decks, and rests upon a socket like the capstan: in its upper end are three or four holes at different heights, through the middle of it, above one another; into which long bars are thrust, whose length is nearly equal to the breadth of the deck. It is employed to
wind

wind in the cable, and for other purposes requiring a great mechanical power.

The crab with three claws is used to launch ships, and to heave them into the dock or off the key. See *Plate XVIII. Mechanics. fig. 1.*

CRAB catcher, in *Ornithology*, a variety of the *ALCEDO Alcyon* of Gmelin; the *martin-pecheur de la Louisiane* of Buffon;—and also to a variety of the *ARDEA virescens*, the small bittern of Ray and Sloane, and the *Etoile* of Buffon.

CRAB'S Claws, or *CRAB'S Eyes*, *Chela Cancrorum*, in the *Materia Medica*, the tips of the common crab broken off at the verge of the black part; so much of the extremity of the claws only being used in medicine, as is tinged with this colour. The blackness, however, is only superficial; they are of a greyish white within, and, when levigated, furnish a tolerably white powder: this is of the number of the alkaline absorbent powders, but superior to most of them. It makes the basis of the famous Gascoign powder, the *lapis contrayerva*, and many other of the compound sudorific powders; and is sometimes, though rarely, prescribed singly. The compound powder of crab's claws is directed in the London Pharmacopœia to be prepared by taking of the claws, prepared, one pound, and of chalk and red coral, of each, prepared, three ounces by weight, and mixing them. The compound powder of contrayerva is prepared by mixing of powdered contrayerva 5 ounces by weight, and of compound powder of crab's claws 1½ pound.

It is the common opinion, that these crab's eyes act as mere absorbents in the *prima via*, and extend their efficacy no farther than those passages. The French memoirs, however, give us an account of their certainly passing into the blood, in a remarkable case. *Mem. Acad. Par. 1709.*

CRAB'S Eyes, *Oculi Cancrorum*, or *Lapides Cancrorum*, in *Natural History* and *Medicine*, are little, white, round, stones, ordinarily flat; so called, though really taken out of the cray-fish, or river lobster: and bearing no great resemblance to eyes, though resembling them more than any other part. They are used in medicine as a powerful alkali, or absorbent.

The most able naturalists long imagined them formed in the brain of the animal. Van Helmont first found them in the region of the stomach: M. Geoffroy, the younger, has observed the manner of their formation much more accurately. Whilst the shell of the cray-fish, which it casts every year, is hardening, a white nutritious juice, secreted in two portions of the stomach, forms, by degrees, a soft calculous substance, of a crustaceous texture, from successive appositions of the juice. Before the casting of the shell, the animal is in a weak and sickly state; takes no food for some days; and in this period the calculi seem to serve for its nourishment. And on this account the crab's eyes are met with only whilst the fish are losing their shells, and for a few days afterwards, and not for a considerable time after this period. Neumann.

CRAB'S Island, in *Geography*, derives its name from the number of crabs that are found there. It is considerably larger than St. Cruz; but, from the jealousy of the European powers, remains uncultivated. The Spaniards had formerly some plantations on it; but government, apprehending that the planter might carry on a smuggling trade, they were removed to Porto Rico. In 1718, the English settled there; but they were attacked by the Spaniards, who murdered some, and carried the survivors to Porto Rico. Since this period, the English, Danes, and Spaniards have used this island in common for the purposes of wood-

ing, watering, and fishing. The island is remarkably fertile and has plenty of excellent fresh water. See *BIRKA*.

CRAB Island, a rocky island of the Arabian gulf, near the coast of Abyssinia. N. lat. 13 2' 45". E. long. 47° 25'.

CRAB Lice, a troublesome kind of vermin, which stick to fast with their claws to the skin, as to render it difficult to dislodge them. Being viewed with a glass, they nearly resemble the small crab-fish; whence they obtained their popular name. They are also called *phœdula*, *morsiones*, *petole*, and *psollate*: they usually infest the arm-pits, eyelids, eye-brows, and pudenda.

They will be quickly destroyed, and drop off dead, upon the application of a rag wet with the milk of sublimate. This sort of vermin is vulgarly reckoned to prognosticate mortality to those whom they abandon, without being removed by medicine.

CRAB-Orchard, in *Geography*, a post-town of America, on Dick's river, in Kentucky; 8 miles from Cumberland river, and 25 miles S. E. of Danyille. The road to Virginia passes through this place.

CRAB-Tree, in *Botany*. See *PYRUS malus*.

CRAB Valley, in *Geography*, a bay on the west coast of the island of Antigua; two miles S. from Reed Point.

CRABASIA, in *Ancient Geography*, a town of Iberia or Hispania. Steph. Byz.

CRABET, *WOUTER* and *DIRK*, in *Biography*, two brothers, painters on glass in the 16th century. They are said by some to have been natives of France, by others of Germany; but it is most probable that they were born at Gouda in Holland, where they painted the windows of the great church with such force and brilliancy, that the work has been esteemed the most excellent of its kind in Europe. The subjects are from sacred story: the following are the most worthy of remark. A window painted by Wouter, in 1564, representing the birth of Christ, and another by Dirk, in 1567, in which is introduced Christ driving the buyers and sellers out of the temple. Dirk died in 1601. *Déscamps*.

CRABETJE. See *ASSELYN*.

CRABIER, in *Zoology*, the name given by Buffon to the *DIDELPHIS cancrivora* of Gmelin.

CRABIER, *Martin-pecheur*, in *Ornithology*, a name given by Buffon to a variety of the *ALCEDO Senegalensis*, or crab-eating king-fisher of Latham;—also, to the *ARDEA ludoviciana*, *cornuta*, &c. &c.

CRABRO, in *Entomology*, a species of *VESPA*, which see:—and also a name by Geoffroy to the *TENTHredo femorata*.

CRABRONES, a class or division of the genus *Vespa* by Fabricius, including those with filiform antennæ.

CRACATOA, in *Geography*, an island, the southernmost of a group, situated in the entrance of the straits of Sunda. It has a high-peaked hill on the south end, which lies in S. lat. 6° 9', and E. long. 105° 15'. The whole circuit of the island is not more than 3 leagues. Off the N.E. end lies a small island, which forms an anchoring road, and within a reef that runs off the S. end of the latter, there is good shelter against all northerly winds, with 18 fathoms water near the reef, and 27 in the mid-channel. To the N.W. there is a narrow pass for boats between the two islands. The shore, which forms the western side of the road, is in a N.W. direction, and has a bank of coral stretching into the sea, about one-third of a cable's length, which makes the landing difficult for boats, except at high water; but the anchoring ground is good, and free from rocks. A little to the southward is a very hot spring, which is used by the natives as a bath.

Cracatoa is esteemed very healthy, in comparison of the neighbouring countries. It consists of high land, rising gradually on all sides from the sea; and the whole is covered with trees, except a few spots which the natives have cleared for rice-fields. The population is inconsiderable. The chief of the island, like those of all the islands in the straits, is subject to the king of Bantam. The coral-reefs afford plenty of small turtles; but other refreshments are scarce and very dear. The latitude of the road in which captain Cook anchored with the Resolution was $8^{\circ} 6' S.$; the longitude by Mr. Bayly's time-keeper, $104^{\circ} 48' E.$, and by observation, $105^{\circ} 36' E.$: the dip of the S. end of the magnetic needle $26^{\circ} 3'$; the variation of the compass $1^{\circ} 0' W.$ On the full and change days, it is high water about seven in the morning; and the water rises three feet two inches perpendicular.

CRACCA, in *Botany*, Riv. See *Vicia cracca*.

CRACCA flore ochroleuco, Riv. See *Vicia pisiformis*.

CRACCA floribus albis, Buxb. See *Vicia bithynica*.

CRACCA major, Taber. See *Vicia sepium*.

CRACCA minor, Taber. Riv. See *Eryum hirsutum*.

CRACCA minor cum siliquis gemellis, Riv. See *Eryum tetraspermum*.

CRACCA sylvatica, Riv. See *Vicia dumetorum*.

CRACHE, in *Commerce*, a piece of coin current at Florence and Leghorn, at three-farthings.

CRACINAS, in *Ancient Geography*, an island of the ocean, near the coast of Gallia Aquitanea.

CRACKAU, in *Geography*, a small town of Saxony on the river Pulsnitz, in the circle of Meissen, on the boundaries of Upper Lusatia, part of the town being actually situated in Upper Lusatia—Also, a Saxon village of the same name in the bishopric of Merseburg.

CRACKER, or *SEA-PHEASANT*, in *Ornithology*, names given by Ray, Willughby, and Albin to the pin-tail of Pennant and Latham, or the *ANAS ACUTA* of Gmelin, with an acuminate lengthened tail, beneath black, a white line on each side of the head, and an undulated cinereous back. It inhabits America, Europe, and the southern part of Asia, and in winter migrates in flocks towards the south as far as Italy and the Caspian sea.

CRACKER, in *Pyrotechny*, is formed in the following manner: Cut some cartridge paper into pieces $3\frac{1}{2}$ inches broad, and 1 foot long; fold down one edge of each length-wise about a quarter of an inch broad; then fold the double edge down one-fourth of an inch, and turn the single edge back half over the double fold; then open it, and lay all along the channel, which is formed by the folding of the paper, some meal-gunpowder; then fold it over and over till the whole paper is doubled up, rubbing it down every turn; this done, bend it backwards and forwards about $2\frac{1}{2}$ inches at a time, as oft as the paper will allow; then hold all these folds flat and close, and with a small pinching cord give one turn round the middle of the cracker, and pinch it close: then bind it with a packthread as tight as possible; and in the part where it was pinched, prime one end of it, and cap it with touch-paper. When these crackers are fired, they will give a report at every turn of the paper: if you wish to have a great number of bounces, you must cut the paper longer, or join them after they are made; but if they are made very long before they are pinched, you must provide a piece of wood, with a groove in it, deep enough to let in half the cracker; this will hold it straight while it is pinching. A cracker is represented complete in *Plate I. Pyrotechny, fig. 1.*

CRACKOWES, in *British Antiquity*, a sort of long-pointed shoes that were used in the 14th century and after-

wards, and in which it was impossible to walk till they were fastened to the knees with chains. The upper parts of these shoes were cut in the form of a church-window: accordingly Chaucer's spruce parish clerk Abfalom,

“Had Paul's windowes corven on his shose.”

This fashion was condemned by the papal bulls, the decrees of councils, and the declamations of the clergy: and yet it prevailed, in some degree, for almost three centuries. At length the parliament of England interposed, by an act, A. D. 1463, prohibiting the use of shoes or boots with pikes exceeding two inches in length, and forbidding all shoemakers to make shoes or boots with longer pikes, under severe penalties. (3 Edw. IV. c. 1.) But even this was not sufficient to put an end to this ridiculous and inconvenient fashion. The civil power called in the aid of the church; and a proclamation was published in all parts of England, denouncing the dreaded sentence of excommunication, besides all other penalties, against all who used shoes or boots with pikes longer than two inches.

CRACKS, in *the Hoofs of Horses*, or as they are usually termed *sand cracks*, are clefts or fissures happening to every part of the hoof; though the toe, or the sides of the hoof, are the parts most subject to this malady.

Splits in the hoofs are frequently, especially at their commencement, superficial, not penetrating through the solid thickness of the hoof, in which case, as they do not produce lameness, they are rarely regarded; at other times, the fissure passing entirely through the hoof, and communicating with the quick, dirt and gravel get into them, and by the contact and friction of these extraneous matters upon the living parts, they produce excessive irritation, pain, and lameness; hence they have been called by smiths and stablemen *sand cracks*, which convey a false notion, because the sand is in no respect the cause of the crack, as the name would imply, but casually occupies it after it has been formed by other means.

Some affect to call those sand-cracks only which happen at the toe or front of the hoof, not extending that appellation to the cracks which happen to the sides or quarters. As however the distinction appears to be frivolous and without use, we shall consider all cracks of the hoof as of the same nature, producing the same effects, and requiring the same treatment, and not deserving a separate designation, which would only create confused ideas of them, and retard and obscure the progress of the science.

When these cracks have been cut out, and proper precautions have not been used to prevent their recurrence, they return with aggravated effects each time, with greater weakness of the part, and increased difficulty of cure: their depth becomes greater, and the powers of uniting the divided portions of the hoof less, and many consider them almost or quite incurable. In cutting out the crack with the drawing knife, the quick is very subject to get injured by dips of the knife; in this case blood flows and obscures the crack, and fungous risings of the quick, pinched by the crack, become troublesome to manage, and create excessive pain and lameness. There is, however, a method of treating these cases that, without much risk or trouble, ensures their cure, and the restoration of the hoof; and is also recommended by its simplicity, which we shall presently describe, after first making a few remarks on the nature, appearance, and origin of these cracks of the hoof.

It may be almost ever observed, that the nearer the crack is to the front of the hoof, the more direct and perpendicular its direction, following at the toe the exact direction of the grain or fibre of the hoof; at least, such is their general appearance before they have been disturbed by the

operator. The two broken surfaces meet in equal union, whilst those on the quarters or sides of the hoofs, which are generally about the middle or nearer to the heels than this, are irregular in their course, sometimes oblique, transverse, or waving; at other times shelving under in such a way, as to meet the quick at a considerable distance from the external opening, as though the hoof was made of two tables, or laminae, which had been separated.

The cause appears to be this, that the horn at the quarters is more flexible than at the toe, and especially when it approaches the heels: and again, these parts lie more immediately under the perpendicular weight of the body than the toe does. If the horn of this part therefore, from any cause, becomes too dry and brittle, it is subject to crack from mere dryness, or to be rent by the weight, &c.; hence we see these kinds of cracks most frequently in blood-horses, whose hoofs are thin and hard, while the other kind of crack, that is, the front crack, is more often seen in cart and heavy draft-horses; to which may also be added, that the fibre of the hoof towards the heels, is in the transverse direction of the pressure, which is not the case at the toe.

Such things occur, though rarely, as transverse cracks, both in the front and the sides of the hoof; the growth alone is, however, more apt to remove these, which makes them pass unnoticed, whilst the longitudinal crack will continue to extend itself in spite of the growth.

The strongest hoofs of heavy draft-horses are sometimes split in front, which one should be at a loss to account for from any natural cause. It always almost happens near the middle of the toe, as we have stated, and one should apprehend either that the straining or drawing did this; or that the foot unevenly pared, or the shoe unevenly fitted to the wall of the foot, occasioned one-half of the foot to take only a partial bearing upon it, when the violence of the exertion rends the hoof asunder, following the course of the fibre. One cannot so readily conceive, that the violence of the nailing and clenching up the nails could sometimes be the cause of this accident. Drawing the two halves of the hoof in opposite directions, though the strongest are sometimes seen thus divided, yet the weaker, wrinkled, dry, thin, and as the smiths call them, *shelly hoofs*, are most commonly the sufferers from this cause. A clip at the toe, such as is usual in draft-horses, hammered down too violently upon the hoof in front, and this ordinarily is done without any measure or guide in respect to its pressure, might press upon and split the hoof in some cases. We have seen the coffin-bone, after death, fairly impressed with a concave mark, the effect of this pressure from the clip, and which could not but have been attended with more or less pain, according to the degree of violence that induced it.

A tread on the coronet from the caulkin of another horse, or from another foot of the same horse, by disordering the coronet, would produce a weakness in the horn growing from that part, and induce a sand-crack in any part whatever of the hoof, and is not a very unfrequent occurrence.

There is another and more simple cause of these cracks than any we have yet described, and perhaps it is the more frequent of any, *viz.* a natural want of moisture or succulence in the hoof; or the same deficiency artificially induced will occasion a small cracking of the external shell or cuticle of the hoof. A minute and almost imperceptible fissure forms and admits air to the interior of the hoof. This being more succulent in its nature than the external covering, dries, consequently contracts, and in contracting, extends the crack in both directions. The dryness of the stable,

the summer heats, or the winds of March, especially facilitate this process. The cracks successively extend, and, in more or less time, as they are favoured by these circumstances, reach the quick, and the consequences ensue that are above described. The weight and movements of the horse, after a certain time, the hoof becoming too weak to sustain them, complete the fissure.

If the fissure at its commencement be low down the hoof, and be retarded in its enlargement by the opposite circumstances to the above, it may be carried out by the growth, and no ill consequence arise from it.

In respect to the cure it is at present usual to cut out these cracks when they occur, and fire them afterwards with a red-hot iron; this certainly melts the hoof together and closes the crack for the time: it however renders the burnt horn more brittle afterwards, and disposes it the more to return if uncovered. The inflammation also in the parts beneath cannot be attended with any beneficial consequences; in such a case they shrink afterwards, and render the cure, on a relapse, much more tedious and difficult, it being for the most part according to the degree of heat employed, attended with a loss of substance or absorption proportionate.

The perfect exclusion of the air from the crack is, in incipient cases, all that is necessary for a perfect restoration of the hoof; that is, the crack, unable under these circumstances to extend itself, grows out therefrom: it is necessary to continue the means till it be near or quite at the bottom of the hoof, with no appearance of its extending upwards. The ointment that we have used with great success in these cases is made of tallow, wax, and tar; to equal parts of the two former ingredients, a sufficiency of tar is added to give it a tenacious consistence: this smeared over the hoof forms a good defence against the air, and is better than oils, which appear to sink in and inflame the foot. The ointment well pressed into the crack, or spread on leather or linnen, or pledgedets of tow, and tied on, is the mode of its application. In other cases, where the application of ties would be inconvenient, or might not be desirable on account of the appearance, a very adhesive, tenacious mass to fill up any channel or cavity in the hoof, is made of equal parts of common turpentine and wax, with a sixth part of tar to colour it; and for dealers or others wishing to conceal defects it is particularly suited.

From the simplest occurrence of a crack, we proceed to the treatment of a worse case, where the quick is exposed to the irritation of foreign bodies. Here the crack must be fully exposed with the drawing knife till these particles can be reached and washed out; this should be preceded by washing the wound with tincture of myrrh, and applying a pledget of *turpentine*, or *rather resinous digestive* over it for a few days, and continuing to exclude the air as above described till the hoof has grown out entire, or has formed a strong shoot of horn from the coronet that shall remove any suspicions about its future security.

In a very old crack it will be found, that an impression or channel has been made in the coffin-bone itself, as may be observed by macerating the bone after death; and the crack therefore being deeper, is more difficultly got at without wounding the quick on either side. In such case, after rasping the hoof under the coronary ring, as deep as possible without inducing a flow of blood, which in all operations of the hoof should be carefully avoided, as it obscures the parts to be cut, and makes the process more difficult and uncertain; as the quick on either side is higher than the crack, the rasp can be used no longer, a fine small drawing knife therefore best completes the excision of the cleft. If, however, as is sometimes the case, it be so deep and so surrounded with living

parts

parts that it is next to impossible to entirely obliterate it without wounding them by dips of the knife, it is then best to ease up the foot in the dressings, and wait a week or more, when it will be found that the growth has rendered the perfect excision of the fissure a matter of no great difficulty. A knob of horn from the coronet usually follows this operation, which effectually prevents the return of the crack if kept moist or smeared with the unguent.

Where the crack, from being of very long standing, has no powers left of union, or when united breaks up again, as when they persist in using the horse, it will be necessary to remove the hoof to a considerable distance from each side the crack, and render it as thin as possible; so that the play of the hoof, that is, the unequal movement of its two portions, shall not interrupt the regular growth of the crack, or break up the growth that is formed entire at the coronet.

In the worst cases that can well occur, as where by firing and other means the parts under the cracks have been much injured, and by bad operating numerous funguses have arisen in the crack, it is preferable to operate in the following way: Clear away the horn to a certain distance on each side of the crack after reducing it as thin as possible with the rasp and drawing knife, pass a scalpel through to the elastic processes, then with a pincers elevate the strip and draw it off upwards, concluding at the coronet; this being done on either side the crack, the funguses being no longer irritated by the contact of the horn are easily managed, and the growth soon fills up the space with new horn. In lesser cases this, though a certain and ready way, is not advised, being not only extremely painful in itself, but the elastic processes so disturbed are never afterwards perfectly re-produced. We should leave this account of sand-crack very imperfect if we omitted to speak particularly of those fungous elevations of the quick, which to manage are often more troublesome and difficult than the crack itself. Compression in some cases will do, but excision in general is necessary, with compression afterwards; the edges of the horn too, irritating and surrounding them, being carefully removed.

If these funguses are not well reduced and brought to a correspondent state to the horn growing over them, they do not kindly unite with it, and a disease of a most singular kind is produced, that has hitherto we apprehend been unnamed or described. It is a morbid kind of horn that is produced, and is of a yellower cast than the natural horn, partaking of the structure and appearance very much of the funguses growing from trees or boletus; the natural horn grows over this, pressing it against the quick, occasioning great lameness. Pricks by the nails of the shoe injuring the coffin-bone will occasion also formations of this sort. This rib of bastard horn grows out with the other, widening as it descends, forming a bone whose apex was the original diseased point. The cure of this, which if not understood, as was the case in our earlier practice, is truly troublesome; nothing less than the total removal of all the horn above and about the morbid rib, and plucking it out entirely will effect the cure, for it returns again and again if the smallest portion be left. The horn that first forms after a bad injury of the coffin bone will produce this sort of bastard growth if it is not removed, so that it is necessary to pare away the first growth and keep it from being too rapidly carried down by the growth from the coronet.

In concluding it may not be useless advice, also, to forbid the smith's rasping away the external covering or cuticle of the hoof after shoeing, which they are very apt to do to give a clean and new appearance to the hoof, thereby removing its natu-

ral coat and defence, and exposing it to dry and crack. The groom should often wet the feet, and if too dry keep them clothed with wet rags, or apply some sebaceous unguent to prevent the atmosphere from robbing them of their moisture. The oil-case is commonly resorted to by the grooms for this purpose, using the rancid oil they clean their bits and harness with; this may be better than nothing; but it is still subject to the objection we formerly mentioned of sinking in instead of remaining upon the surface, and producing heat and inflammation of the feet, which the animal fats are, we believe, not so subject to do.

As the well-being of the feet is of the first importance in horses, and nothing can go on well if they are amiss, so we shall hardly apologize for the length of narrative this disease has drawn us into; for these matters have never yet been very clearly stated, we believe, to the public, and length of narrative does not ever infer prolixity.

The perspiration, we may also remark, is passing off with surprising rapidity through the driest hoofs, as may be seen by letting a horse place his foot on a cold metal plate, the perspiration in extraordinary abundance is soon collected in drops upon the plate, so that its quantity in a given time can be readily ascertained; and also whether these artificial coverings increase or diminish the quantity, and with what circumstances this is attended in respect to the feet.

The shoeing also is vastly facilitated by the hoof being kept of a proper degree of flexibility and toughness, instead of that hard, dry, and brittle condition it is often found in, and which renders it more apt to split with the nails, and produce other mischiefs by turning them.

Going to graze during the growing out of a sand-crack has been much and justly extolled; it is only beneficial from the moisture it brings to the hoof; wetting artificially, by plunging the foot with its dressing in a bucket of water will, with the above precautions, serve pretty much the same purpose; for it often happens the horse cannot, without great inconvenience, be spared to go out, and the time of year may also forbid it.

CRACO, in *Geography*, a town of Naples, in the province of Basilicata; 8 miles N.N.W. of Turin.

CRACOVIA, a palatinate of Poland, bounded on the N. by Sinadia, on the N.E. by that of Sandomir, on the S. by Hungary, and on the W. by Silesia. The principal towns are Cracow and Landseron.

CRACOW, in Latin *Cracovia*, or *Carrodunum*, anciently the capital of Poland, where the kings were elected and crowned, is now the seat of the Austrian government of West Galicia in the kingdom of Gallicia and Lodomeria. This is the name given by the House of Austria to the two extensive portions of Poland which fell to its share at the first partition in 1772, and on the final division and extinction of the kingdom of Poland in 1795.

Cracow is situated in an extensive plain watered by the Vistula, which is broad and shallow, 135 miles S.W. of Warsaw, 216 miles N.E. of Vienna, and 870 N.W. of Constantinople. E. long. 20° 16'. N. lat. 50° 10'. The city and suburbs occupy a large tract of ground, but scarcely contain 16,000 inhabitants. Many of the streets are broad and handsome; the great square is very spacious and has several well built houses, but mostly either untenanted or in a state of melancholy decay. Almost every building bears striking marks of ruined grandeur; the churches alone seem to preserve their original splendour. The devastation of this unfortunate city was begun by the Swedes in 1702, when it was besieged and taken by Charles XII.; but the mischiefs it suffered from that ravager of the North,

were far less destructive than those which it experienced during the dreadful commotions that agitated Poland in 1770 and 1794, when it underwent repeated sieges, and was alternately in possession of the Russians and of the Confederates. Cracow still exhibits the remains of a magnificent capital in ruins.

The town is surrounded with high walls of brick, strengthened by round and square towers of whimsical shapes in the ancient style of fortification, which were built by Venceslaus, king of Bohemia, during the short period in which he reigned over Poland.

Cracow is the see of a bishop and an university. The latter was founded upon the model of the university of Paris, endowed by Casimir the Great, and improved and completed by Ladislaus Jaghellon in 1400. The library is not remarkable either for the number or rarity of the volumes. Among the principal, however, is a Turkish book of no intrinsic value, but esteemed a curiosity on account of its having been found in the spoils at the battle of Choczim, and presented to the university by the celebrated John Sobiesky, as a memorial of a victory which saved his country from desolation and raised him to the throne of Poland. The most flourishing period of the university of Cracow, was under Sigismund Augustus in the sixteenth century, when several of the German reformers fled from the persecutions of the emperor Charles V., and found an asylum in this city. They gave to the world several versions of the Sacred Writings and other theological publications which diffused the reformed religion over great part of Poland.

In the cathedral of Cracow all the Polish sovereigns, from the time of Ladislaus Loketec, have been interred, except Louis and Ladislaus III. whose bodies were deposited in Hungary; Alexander who was buried at Vilna; Henry of Valois; Augustus III., and the last king. The sepulchres of the kings of Poland are not distinguished by peculiar magnificence; their figures are carved in marble of no extraordinary workmanship, and some are without inscriptions. When Charles XII. of Sweden was at Cracow he visited these tombs, out of respect to the memory of John Sobiesky, over whose tomb he is reported to have exclaimed: "What a pity that so great a man should ever die!"

The art of printing was first introduced into Poland at Cracow by Haller, and one of the earliest books that issued from his press was, the Constitutions and Statutes compiled by Casimir the Great and augmented by his Successors. The characters are Gothic, the same as were universally used at the invention of printing; the great initial letters are wanting. This publication must have been anterior to 1496, as it does not contain the statutes passed by John Albert in that year.

Towards the southern part of Cracow, near the Vistula, the citadel, surrounded with brick walls and old turrets, forms a conspicuous object on the summit of a rock. This citadel or palace owed its origin to Ladislaus Jaghellon, but the greater part was demolished by Charles XII. in 1702, when he entered Cracow in triumph after the battle of Clifow; the remains consist in a few apartments which are left in the same state as they were in the seventeenth century. It was anciently the residence of the Polish monarchs, who from the time of Ladislaus Loketec were all crowned at Cracow, except the last king, whose coronation was solemnized at Warsaw.

On a sandy plain near Cracow are two large barrows. One is by tradition called the burial place of Cracus, duke of Poland, who is supposed to have built the town in 700.

The other is called the sepulchre of his daughter Vanda, who is reported to have drowned herself in the Vistula to avoid marrying a man whom she detested.

Near Cracow are also the remains of an old structure called the palace of Casimir the Great, and the famous salt-mines of Wieliczka. Coxe's Travels. See WIELICZKA.

CRACRA, in *Ornithology*, so called from its cry on the wing, by the French settlers at Martinico. It is the *CANCROPHAGUS Americanus* of Brisson, and the *ARDEA Cracra* of Gmelin, and is found in Chili, and other parts of America, on the banks of sea-rivers. F. Feuilleé describes it as a bird of the size of a well-grown hen, with its plumage much variegated; the crown of the head is ash-blue; the top of its back tawny, and the rest of its upper surface has an agreeable mixture of ash-blue, brown-green, and yellow; the coverts of the wing are partly of a dull-green, edged with yellowish, and partly black; the quills are black, fringed with white; the throat and breast are variegated with spots of filemot, on a white ground; the legs are of a fine yellow.

CRADA, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

CRADLE, a well-known machine, in which children are rocked to sleep.

It also denotes that part of the stock of a cross-bow, in which the bullet is put.

CRADLE, in *Engraving*, is the name of an instrument used in scraping mezzotintoes, and preparing the plate. It is formed of steel, resembling a chissel, with one sloping side, upon which are cut hollow lines very near each other, and at equal distances. The acting part of this tool is made circular, and the corners are rounded. After being properly tempered, it must be sharpened on the whetstone. There are various sizes of this instrument.

CRADLE, in *Husbandry*, a part often added to a scythe, in order to gather the corn into swaths, when it is mowed.

CRADLE, or *Coffer*, in *Engineering*, is the term used for a large wooden trunk, open at top, and with moveable ends, large enough to receive a barge or vessel when floating on a canal, for the purpose of raising or lowering it to a higher or lower pound of the canal, by cranes or other means, without the use of a pound-lock. See CANAL.—This term is also applied to a segment of a hollow cylinder, formed of ribs and lattice, similar to the centering used by bricklayers and masons for turning culverts and arches upon, but made fair or smooth within side instead of without, for supporting and retaining the shape of the inverted arch or lower half of a culvert in soft ground, particularly in quick-sands, and peaty places. A very slight cradle of this kind will sometimes prevent the distortion, and ultimate fall, of a round or barrel culvert; and this precaution should never be omitted, in laying culverts under canals or roads in soft ground, where the failing of a culvert may prove of the greatest inconvenience. See CULVERT.

CRADLE, in *Ship-building*, a frame of timber raised along the outside of a ship, by the bidge, for the more commodious and secure launching of the vessel. The cradle is much used in Italy, Spain, and Turkey; where they also trim great vessels in the cradle.

CRADLE, in *Surgery*, a case in which a broken leg is laid, after being set.

CRADOCK, SAMUEL, in *Biography*, a learned non-conformist of considerable celebrity in the 17th century. He was educated for the church at Emanuel college, Cambridge, where he took his several degrees, obtained a fellowship, and succeeded to a living in Somersetshire. The act of uniformity forced him to relinquish his preferment, and

to retire to a small estate in Suffolk, where he preached without any view to emolument, and employed himself in the arduous task of education. He afterwards settled with a congregation in the neighbourhood of Bishop's Stortford, Herts, where he died in the year 1706, being about 86 years of age. He published many works, chiefly on theological subjects, of which the principal were, "A Harmony of the four Evangelists;" "The Apostolical History till the Destruction of Jerusalem;" and "The History of the Old Testament." These were in folio. "An Exposition and Paraphrase of the Revelation" was printed in 8vo. His several pieces were highly esteemed in his day, and they exhibit much learning, an accurate acquaintance with the scriptures, and a rational and manly piety. Calamy.

CRAESBECK, VAN JOST, a painter, a native of Brussels. He was originally a baker, but being upon terms of intimacy with Adria Brauwer, that master taught him the principles of his art, and he commenced painter. Like his master, Craesbeck painted subjects in low life, as the quarrels of drunken men, and frequently represented both his friends and himself with a patch over one eye, making strange distortions of countenance. Though not equal to Brauwer, he is justly considered the best imitator of the style of that extraordinary master. This eccentric artist died in 1641, aged 32. Descamps. Heineken.

CRAFT, a sea-term, signifying all manner of lines, nets, hooks, and the like, which serve for fishing. See **FISHING**.

Hence, as those who use the fishing-trade, use small vessels, such as ketches, hoys, smacks, &c. they call such little vessels *small craft*.

It denotes, also, the boats and vessels used in inland navigation.

CRAGUS, in *Ancient Geography*, a town of Asia Minor, in Lycia, situated, according to Strabo, on mount Cragus, which was a craggy rock on the sea-coast of Cilicia. Ptolemy.

CRAGUS, was also a promontory of Asia Minor, at the extremity of Caria towards Lycia.

CRAIBURG, in *Geography*, a market-town of Upper Bavaria, on the river Inn, with a castle, in the district of Craiburg.

CRAICH, a river of Germany, which runs into the Rhine, opposite to Spire.

CRAIERA, CRAYER, a small vessel of lading; as a hoy, or smack. 2 Ric. II. Stat. 14 Car. II. c. 27.

CRAIG, JOHN, in *Biography*, a learned mathematician, a native of Scotland, and well known for many papers recorded in the Philosophical Transactions, and in the Acta Eruditorum. He had a controversy with Bernoulli, in which Leibnitz took a part, espousing the cause of Craig. The paper by which he is most distinguished is entitled, "Theologiæ Christianæ Principia Mathematica," printed in the Transactions for the year 1699. In this Mr. Craig undertakes to apply mathematical calculations to the credibility of the history of Jesus Christ. His notions are whimsical, as the reader will easily imagine, when he is informed that he attempts to prove, 1. That the certainty of the history of Jesus Christ would have totally ceased with the eighth century, had it not rested on more than the oral testimony of one; 2. That the probability of this history, written by four historians, and propagated by a great many copies of their works, was as strong at the time he composed his paper, (that is, in 1690,) as it would have been in the time of Christ, to a person who had heard it related by the disciples; 3. That the probability of this history, at the end of 3150

years, reckoning from the birth of Christ, will entirely cease, and consequently that this will be the epoch when the Son of God will come to judge the world, because then there will be no faith on the earth. This work has been republished in Germany and France, but with a view principally of overturning his system. Neither the time of the birth, nor that of the death, of Mr. Craig has been ascertained. Gen. Biog.

CRAIG, WILLIAM, was born at Glasgow in the year 1709, where he was educated, and became a great proficient in classical learning and in moral philosophy. He studied also with much diligence theology, which he intended to make the business of his life. The first living into which he was inducted was in Clydesdale: this he resigned, on being appointed minister of a church in his native city; and on the death of Potter, the professor of divinity, he was proposed as his successor; but Dr. Leechman being also a candidate, Mr. Craig solicited his own friends to transfer their votes to the doctor, whom he regarded as best qualified for the situation. Mr. Craig continued to exert his talents in the more private line of preacher. He published at different times some single sermons, "An Essay on the Life of Jesus Christ," and "A Volume of Discourses" in 1775. He lived to the age of 74, was twice married, and about the year 1764 the degree of doctor in divinity was conferred upon him. Biog. Brit.

CRAIG-ALVIE, in *Geography*, a mountain of Scotland, in the S.W. part of the county of Murray, a little N. of the river Spey.

CRAIGAN, a mountain of Scotland, in the county of Perth; 15 miles N.W. of Perth.

CRAIG-BENYON, a mountain of Scotland, in the county of Perth; 3 miles N.E. of Callender.

CRAIG-DARIE, a cape of Scotland, on the E. coast of the county of Kincardine.

CRAIGENDIVE, a small island near the W. coast of Scotland; 4 miles E. from the island of Jura.

CRAIGGAG POINT, a cape of Scotland, on the E. coast of the county of Sutherland; 16 miles N.E. of Dornach.

CRAIGILLACHY, a solitary mountain in the Highlands of Scotland, that overlooks the entrance to Strathpey, and has for ages past been considered as a kind of rallying point to the clan that inhabit it. On any sudden invasion of the Norwegians on the eastern coast, a fire kindled on some mountain near the sea was instantly seen in Strathpey, and answered by another on Craigillachy, and that again by another on Craigow in Badenoch; so that the intelligence was in this manner often transmitted from the east sea to the west in three hours. By means of this simple telegraph, the whole country was up in an instant to resist invasion. Craigillachy is the war cry of the clan "Grand;" and even within these few years, if one of them was borne down or injured in any popular tumult, at a fair or public concourse out of his own country, he cried aloud "Craigillachy," and every person within hearing, allied by descent or marriage to the clan, flew to his rescue. The motto of the clan is "Stand fast, Craigillachy."

CRAIG-LEITH, a small island of Scotland, in the Frith of Forth, about a mile N. of North Berwick.

CRAIG-LOGAN, a cape of Scotland, on the N.W. extremity of the county of Wigton; 9 miles N.N.W. of Strathrazer.

CRAIGNESS LOCH, in Argyleshire, is one of the lakes or inlets of the sea, among the western islands and peninsulas of Scotland. It communicates with Loch Crinan, not

far from the western end of the famous canal of that name. See CANAL. It is navigable up to Barbrig, and has the town of Craignefs on its N.W. bank.

CRAIGOW, a mountain of Scotland, in the county of Inverness: 18 miles E. of Fort Augustus.

CRAIL, an engine made use of for catching fish. See CRAB.

CRAIL, in *Geography*, a royal borough in the county of Fife, Scotland. *Caryle*, or *Cair-raille*, as it was originally called, is described by ancient historians as a town of considerable importance in the middle of the 9th century. Robert Bruce honoured Crail with a royal charter, which, with several additional grants, was confirmed by Robert II., queen Mary, James VI., and Charles I. Sibbald asserts that David I. died at Crail; but at present there are no other vestiges of antiquity than the ruins of a castle, where David is said to have resided, and the remains of a priory. The town "is situated on the coast of the Frith of Forth, near Fifeness," and has an inconsiderable unsafe harbour. This disadvantage might, however, be easily obviated, by converting a neighbouring creek into an excellent receptacle for vessels. The houses form two parallel streets, which extend along the shore; but the former exhibit strong marks of decay, which may be attributed in great measure to the decline of the herring fishery. Population in 1798, 1624.

CRAINBURG, or KRAINBURG, or simply *Crain*, or *Krain*, in Latin *Cranioburgum*, a town of Austria, in Upper Carniola, seated on an eminence on the river Sau, 30 miles N.W. of Laubach, formerly the residence of the margraves of Crain or Crainburg. It has a citadel named the *Kisfelslein*, gravel-stone.

CRAINBURG, a mountain of Carniola; 6 miles N.W. of Feldes.

CRAINFELD, a small town of the grand duchy of Hesse Darmstadt, on the river Nidda, north of Hanau.

CRAK, a name given, in the time of the Croisades, to *Petra*, the capital of the Second Arabia.

CRAKANHORPE, RICHARD, in *Biography*, a learned English divine, born at Strickland in Westmoreland, and after having received the usual elementary instructions, he was sent to Queen's College, Oxford, in 1583, and became fellow in 1598. He obtained considerable celebrity for his skill in controversial theology, and was greatly admired as a preacher. He went out, in 1603, as chaplain to an embassy to the emperor of Germany, of which lord Ewers was at the head. Here Mr. Crakanhorpe improved every opportunity which his situation afforded, of cultivating an acquaintance with the German literature and scholars. After his return to his native country, he was appointed chaplain to the bishop of London, and also to his majesty, and obtained the living of Black Notley, near Braintree in Essex. He died in 1624, leaving behind him several MSS., some of which were deposited in Queen's College library. He was the author of many works in his own and in the Latin tongue: of these the chief are, "Justinian the Emperor defended against Cardinal Baronius;" and a "Defence of Constantine, with a Treatise on the Pope's Monarchy;" "Logice Libri Quinque," &c.; and "Tractatus de Providentia Dei."

CRAKE, or LAND-RAIL, in *Ornithology*. See RALLUS *Crax*.

CRAKE-BERRY, in *Botany*. See EMPETRUM *nigrum*.

CRAKENISH POINT, in *Geography*, a cape of Scotland, on the W. coast of the island of Sky; 6 miles N.N.W. of Dunan point.

CRALIOVAVELIKA, a town of Sclavonia, on an

island formed by a small river near the Save; 52 miles E. of Carlstadt, and 136 S. of Vienna. N. lat. 45° 41'. E. long. 16° 27'.

CRAMA, in *Metalurgy*, a name given by the ancients to brass, made by the mixture of copper and the lapis calaminaris, as at this time. They had also a kind of white brass, or mixt metal, made of copper, in use among them, which they esteemed much above the yellow. We find mention of this in Virgil, under the name of *album orichalcum*; and the other old writers often call it *album crama*. We know of many ways of turning copper white: arsenic and many other minerals will do it; and the spoons, and other utensils, which some years ago used to be made of a mixt metal, called alchymy metal, were a sort of white brass. But it does not appear that any of our methods have been the same with that of the ancients: the copper is rendered more brittle, and in some sorts debased, in all our compositions of this kind; but in those of the ancients, it seems to have been rendered more ductile than at first.

CRAMA, CROMA, and CHRAMA, in *Medical Writers*, are used to signify a mixture of things, whether medicines or elements.

CRAMAUD, SIMON DE, in *Biography*, a distinguished cardinal, born in Poitou, in France, towards the close of the fourteenth century; of his education we know nothing; but it is certain, that by his industry, learning, and talents, together with the excellence of his character, he raised himself to public notice, and acquired the esteem and confidence of men of the highest rank in life. He was elevated to the first offices both in church and state, till at length he obtained the archbishopric of Rheims, and was created patriarch of Alexandria. In 1413 he was advanced to the dignity of cardinal, an honour conferred upon him for the great services which he performed in bringing to an end the disputes respecting the rival claims of the sovereign pontiffs at Rome and Avignon. He took an active part in deposing Benedict XIII. from the papal dignity; and, after he had attempted, in vain, to persuade his holiness to resign his office, and renounce the character of sovereign pontiff, he published a treatise to prove the necessity of withdrawing all obedience from that anti-pope, as he was pleased to style him. On the same subject, he was engaged in missions to England and Spain, in order to conciliate those kingdoms to that plan for restoring the peace of the church. He lived to see the object on which he had laboured with so much assiduity, completely accomplished. Benedict was solemnly deposed by the assemblies in France; and their decree was confirmed by the council of Pisa in 1409, in which cardinal Cramaud was appointed publicly to read their final decree. After this, he survived but a very short time. Moreri.

CRAMBA, in *Ancient Geography*, a town of Asia, in the vicinity of a marsh, towards Lydia.

CRAMBE, in *Botany*, (*κρυμβη*, a name given by Dioscorides, Galen, and other Greek authors, to the cabbage, and borrowed from them by the Latins. Derivation uncertain.) Tourn. 100. Linn. gen. 825. Schreb. 1071. Willd. 1220. Gart. 830. Juss. 242. Vent. 3. 116. Clafs and order, *tetradynamia filiculosa*. Nat. Ord. *Siliquosa*, Linn. *Crucifera*. Juil.

Gen. Ch. Cal. Perianth four-leaved; leaves egg-shaped, somewhat spreading, caducous. Cor. Petals four, cruciform, large, broad, obtuse, spreading; claws a little shorter than the calyx. Stam. Filaments six; two the length of the calyx; two longer, forked; anthers simple, on the outward division of the filaments; a melliferous gland between the

the longer stamens and the corolla on each side. *Pist.* Germ superior, oblong; style scarcely any; stigma thickish. *Peric.* Silicle coriaceous, two-jointed; upper joint with one or two seeds; lower one sometimes solid, sometimes one-celled, barren, or with one seed; joints without valves.

Elf. Ch. The four longer filaments forked, one of the tips bearing the anther. Silicle without valves.

Sp. 1. *C. maritima.* Sea Kale. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Flor. Dan. 316. Eng. Bot. 924. (*C. maritima*, brassicæ folio; Tourn. 211. Rai. Syn. 307. *Brassica maritima* monospermos; Bauh. pin. 112.) "Stem and leaves smooth; leaves sinuated, undulated, glaucous." *Root* perennial, fleshy. *Stems* several, proceeding from the crown of the root, spreading, a foot and half or two feet high. *Leaves* alternate, petioled, elliptic-oblong, or roundish, variously lobed and toothed. *Flowers* large, white, clustered in several corymbs, which form altogether a dense terminal panicle. *Silicle* two-jointed; lower joint smaller, one-celled, one seeded; upper-joint very large, globular, two-celled, two-seeded. *Receptacles* in the upper cells filiform, free; in the lower one apparently none; but the seed seems to hang from the top of the cell. As the fruit advances towards maturity, all the seeds generally perish, except one in the upper joint. *Gært.* A native of the sea shore in England, and other parts of Europe, flowering in May and June. This plant is now much cultivated for the sake of its young shoots, which are blanched in the spring, and when boiled, are thought by many to be little inferior to asparagus.

See KALE. 2. *C. orientalis.* Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Willd. 3. (*Rapistrum orientale*, acanthi folio; Tourn.) "Leaves oblong, pinnatifid, runcinate, scabrous; stem smooth." *Root* perennial; Lam. Willd. biennial; Mill. *Root*-leaves large, of a greyish colour. *Stems* three or four feet high, much branched. *Flowers* small, white, very numerous, in a large loose terminal panicle. A native of the Levant, flowering in May and June. 3. *C. laciniata.* Lam. 3. (*C. tatarica*; Jacq. Misc. 2. 274. tab. 25. Mart. 4. *C. tatarica*; Willd. 2.) "Leaves twice pinnated; pinnæ laciniated, toothed, scabrous underneath; stem even-surfaced, much branched." *Root* perennial. *Root-leaves* larger, and more divided, than those of the preceding species. *Stems* three feet high. *Flowers* white, rather larger, in short racemes, forming a less finely divided panicle. A native of Hungary. *Jacquin* supposes that this plant is the *tatarica* *ungarica* of *Clausius*, hist. 2. 191. which is also quoted by *Willdenow* as a synonym; but *La Marck* observes, that *Clausius's* description by no means corresponds with that given above; and probably belongs to his *cachrys pallinacea*, *C. paucifolia* of this work. 4. *C. hispanica.* Linn. Sp. Pl. 3. Mart. 3. Lam. 4. Willd. 4. *Gært.* tab. 142. fig. 4. Lam. Ill. Pl. 553. (*Rapistrum maximum*; *Corn.* Canad. 147. tab. 148. *Morif.* hist. 2. 266. § 3. tab. 13. fig. 1. *Barr.* Ic. 387. *Tourn.* 211. *Myagr. sphaerocarpon*; *Jac.* Obs. 2. 20. tab. 41.) "Whole plant scabrous, with short hairs; leaves pinnate-lyrate; terminal lobe very large, kidney-shaped, obtuse." *Root* annual, whitish, spindle-shaped and fibrous. *Stem* a foot and half high or more, striated, branched in its upper part. *Leaves* alternate, petioled; terminal lobe toothed or crenate; with a single pair of small pinnæ underneath resembling auricles, one of which is sometimes wanting. *Flowers* white, in somewhat branched racemes. *Silicle* small, two-jointed; lower joint oblong, solid, or one-celled, barren; drying as the fruit advances, and appearing like a peduncle to the upper one; upper joint much larger, spherical, coriaceous, smooth, one-celled, valveless, separating spontaneously from the other. *Seed* solitary, nearly globular, much narrower than the cavity of the cell.

A native of Spain. 5. *C. reniformis.* Willd. 5. *Desf.* Atl. 2. 78. tab. 151. "Leaves pinnate-lyrate, hairy; terminal lobe kidney-shaped, acute, deeply toothed; stem filiform, branched." *Stem* furrowed towards the bottom, and scabrous, smooth above. *Flowers* white. A native of Mount Atlas, in the fissures of rocks. 6. *C. filiformis.* Willd. 8. *Jacq.* Ic. rar. 3. tab. 504. *Collect. Supp.* 120. "Leaves interruptedly pinnated, lyrate, hairy; terminal lobe roundish, toothed; stem smooth, filiform, branched, fasciagate." *Root* perennial. *Stem* hairy below, smooth above. *Leaves* clothed with white, rigid hairs. A native of Patagonia. 7. *C. fruticosa.* Linn. jun. *Supp.* 299. *Mart.* 5. *Lam.* 6. *Willd.* 7. "Shrubby leaves egg-shaped, pinnatifid, serrated, hoary; racemes in a loose dichotomous panicle." A stiff shrub, with leafy branches. *Leaves* alternate, petioled, deeply to three or pinnatifid, or pinnated. *Racemes* short. A native of Madeira, flowering most part of the year. *Murray* asserts that the filaments are not forked, and that it ought to be removed to *Myagr. S. C. strigosa.* *Mart.* 6. *Willd.* 8. *L'Herit.* *Stirp.* 1. 152. tab. 72. (*C. scabra*; *Lam.* 5. *Myagr. arborescens*; *Jacq.* Ic. rar. 1. tab. 120.) *La Marck* refers this to the preceding species. "Leaves somewhat cordate-egg-shaped, unequal at the base, hispid, auricled; panicle loose." A rugged shrub. *Stem* from four to six feet high, erect, loosely branched, cinereous. *Leaves* alternate, petioled, unequally toothed, wrinkled, nerved, bright green on both sides, four times the size of those of the preceding species; petioles round on one side, channelled on the other. The stiff hairs which cloath the under surface of the leaves, the petioles and the lower part of the common peduncles, resemble small spines; they are stronger, but not so closely set as in the preceding species. A native of the Canaries. Both these shrubby species were introduced into England by *Maffon*.

CRAMBE *corvini*, *Allion.* See *BUNIAS cochlearioides*.

CRAMBE *foliis lanceolatis dentato-sinuatis*; *Hort. Clif. Roy.* *Gært.* See *MYAGRUM perenne*.

CRAMBE *foliis pinnato-basatis*; *Roy.* See *BUNIAS orientalis*.

CRAMBE *spinosissima arabica*; *Shaw.* *Afr.* See *BUNIAS spinosa*.

CRAMBE *orientalis dentis leonis folio*; *Tourn.* See *BUNIAS orientalis*.

CRAMBUSA, in *Ancient Geography*, a place of Asia Minor, on the coast of Cilicia, near the river Calycadnus, and the promontory Cerycum, according to *Strabo*, *Ptolemy*, &c. *Ptolemy* places it in Pamphylia; *Pliny*, on the coast of Lycia, over against Chimæra.—Also, a town of Lycia, placed by *Strabo*, between Olbia and the sacred promontory.

CRAMER, in *Biography.* See *KRAMER*.

CRAMER, JOHN ANDREW, a celebrated German chemist, born in 1710, near Diefden. To his countrymen has been justly given the honour of teaching the art of mining and metallurgy to all Europe: to effect this, *Cramer* contributed very important services. As a writer, he is justly distinguished by his "Elementa artis Docimasticæ;" by a treatise on the management of forests and timber, and a work on metallurgy. On Assaying he gave public lectures in Holland and England. He invented a process of making artificial gems, which were such close imitations of natural stones as to deceive almost the best judges. He had an excellent turn for natural philosophy, natural history, mathematics, astronomy, and political economy as well as chemistry. *Mr. Cramer* died on the 6th day of December, 1777. The character of this able man deserves notice on account of some singularities which have been recorded by his

his biographers. He was perfectly indifferent to dress, so that he has frequently been taken for a beggar. He would sit down at the table with persons of distinction, in a gold laced coat, but with hands and face covered with soot and dust, just as he came from the laboratory. His own habitation consisted of a kitchen and two other apartments, in which were lying in the greatest confusion his books, models, crucibles, coals, &c. His meat and his sleep he took, as he could find time, without any regard to set periods. Cramer was unquestionably a man of genius, possessed great presence of mind, and a talent at discovering the road to truth in his experiments: his irritable temper joined to his superior knowledge, of which his contemporaries were jealous, led him into many disputes, which, on his part, were not always managed with that respect and decorum which the character and rank of his opponents seemed naturally to claim. His principal work, *viz.* the "Elements of the Art of Assaying," has been translated into the German, English, and French languages, and is still esteemed for the description of the different kinds of minerals, and for a minute but excellent account of almost all the chemical and mechanical processes employed in assaying. The object of his treatise on forests and timber, was to shew how they may be preserved in good condition; how the decayed parts may be restored, and how to derive the greatest benefits from forests. His "Elements of Metallurgy," were left unfinished. The first contains the natural history of minerals, with the theory of the art of assaying; in the second is an account of the operations on a small scale; and the third, which was never written, would have contained a description of the processes employed on a large scale. Gen. Biog.

CRAMER, JOHN ANDREW, a German theologian, born at Jöladt, on the 29th of Jan. 1723, and when he had obtained under his father, and at a private school, a virtuous, and, in some respects, a learned education, he was sent to the university at Leipzig; but his finances were so scanty, that he was obliged to instruct others while he himself took lectures, in order to obtain the accommodations of life. At this period he was also a translator of Bayle's dictionary into the German language, and a corrector of the press; by which means he was enabled to support himself with decency and comfort. In 1745, he read public lectures at Leipzig, and published a weekly paper, entitled "The Guardian Spirit." But he was afterwards better known as the translator of St. Chrysostom's works. In 1750, he became acquainted with count Bernstorff, the Danish minister, through whom he was, in 1754, invited to be chaplain to the court of Copenhagen. From this period he considered Denmark as his second country, where he was distinguished by the appellation of "the thoroughly good." In 1765, he was appointed professor of theology in the university of Copenhagen, in which, as well as in that of Kiel, a fund was established through his means for the support of the widows of the professors. He was disgraced by the part which he took in the revolution in Denmark, in which Struensee took a lead; and having lost his office as chaplain, he retired in 1771 to Lubeck. Three years afterwards he again entered into the Danish service, being appointed professor of theology in the university of Kiel. Cramer died on the 12th of June 1788, at the age of 66. He wrote many original works, and was indefatigable as a translator. He is said to have read with rapidity, and to have composed with readiness and facility. He employed every moment of his time, and frequently read or studied while travelling. His memory was such that he scarcely ever forgot what he had heard, though in ever so cursory a manner. Gen. Biog.

CRAMER, GABRIEL, born at Geneva, the 24th of March 1641, was initiated into the practice of medicine by his father. To perfect him further, he went to Strasburg, where he was created doctor in 1664. He thence returned to Geneva, and rose to be senior, or head of the faculty of medicine there, in which post he died in 1724. His son,

CRAMER, JOHN, ISAAC, who had taken his degree of doctor in 1696, succeeded to his practice, and published an "Epitome of Anatomy," and a "Dissertation on Diseases of the Liver," left by his father. Also, "Thesaurus secretorum curiosorum, in quo curiosa, ad omnes corporis humani tum internos, tum externos morbos curandos, &c. continentur." Lon. Aollb. 1709, 4to. He again was succeeded by his son, John Andrew Cramer, who rendered himself famed by his skill in mineralogy and chemistry; and published at Leyden, in 1739, in two volumes 8vo. *Elementa Artis Docimasticæ*. It was reprinted in 1744, and again translated into French, in 1755. See CRAMER, *supra*. HALK. Bib. Med. Elvy. Dict. Hist.

CRAMLÓW, in *Geography*, a town of Poland, in the palatinate of Cracow; 52 miles N.W. of Cracow.

CRAMP, in *Medicine*, a painful spasm, or spasmodic contraction of a muscle, or muscular part.

The word *cramp* is only applied to those spasms or tonic convulsions (see CONVULSIONS) which are confined to one muscle or organ, or to a small number of muscles; as to the muscles forming the calf of the leg, or those of the foot, &c.; or to a painful contraction of the muscular coat of the stomach. The TETANUS might be denominated an universal cramp. Cramp in the leg is a frequent occurrence, when the bowels are greatly disordered, as in CHOLERA; and it often attacks elderly people, especially in bed, without any obvious cause. Friction often affords relief; and a moderately tight bandage put on the leg on going to bed, will frequently prevent the occurrence of the spasm. It may be often overcome by a forcible exertion of the antagonist muscles; that is, by attempting forcibly to move the member in the opposite direction to that in which it is spasmodically contracted. Thus, if the muscles of the calf of the leg are affected with cramp, dragging the heel upwards, and extending the toes; we should attempt strongly to bring the toes upward, which will tend to stretch the cramped muscles, and thus remove the spasm. Cramp, attacking the stomach, is to be combated by the internal and external employment of stimulants; internally, by the use of opium, æther, and other antispasmodics; or, if these cannot be immediately procured, by a plentiful draught of hot water, or hot wine, or brandy and water: externally, at the same time, heat may be applied in various ways, as by fomentation, or by means of a hot brick, or of a bladder or bottle filled with hot water. But before these expedients are adopted, it should be well ascertained that the pain is in the stomach, and that it arises from spasm, and not from inflammation; for, in the latter case, stimulants would prove highly injurious. That the pain is spasmodic only, will be known by the absence of fever, *i. e.* of a quick sharp pulse, dry tongue, hot skin, thirst, &c. and by its occasional intermission, or change of place. See STOMACH, *inflammation of*; also GOUT.

CRAMP, from *crampon*, Fr. a bar of iron or other metal bent at each extremity, which serves to unite and retain in their places blocks or courses of stone in various parts of a building. Cramps are generally employed in works which require great solidity, such as the piers and abutments of bridges, and the voussloirs of large arches. They are also used to unite the stones of copings and cornices, and generally any external stone-work which would be liable to injury

jury from weather, if the joints were not firmly secured. The most secure manner of fixing cramps is to let them into the stone their whole thickness, and run them with lead; but in slight works, and those which are not exposed to the air, such as chimney pieces, it is sufficient to bed them in plaster. The Romans, who were accustomed to use cramps with the greatest profusion in their solid constructions, generally made them of bronze, which is more durable than iron, as it is not subject to be destroyed by rust; modern builders however constantly employ the latter metal.

CRAMP fish, or *Numb fish*. in *Ichthyology*, the English name of the *Torpedo*. See **RAJA**, and **TORPEDO**.

CRAMP iron, a piece of iron, bent at each extreme, serving to bind together pieces of wood, stones, or other things. See **CRAMP**, *supra*.

CRAMP-irons were distributed to soldiers destined for an escalade. They were fastened to their shoes with solid straps of leather, in order to fix themselves to the wall of the piece. The name of *crampons* has also been given to pieces of iron fastened to the extremities or ends of scaling ladders.

CRAMP-ray, in *Ichthyology*, the *RAJA Torpedo*; which see.

CRAMPONEE, in *Heraldry*. A cross *cramponée*, is that which at each end has a *cramp*, or square piece, coming from it.

CRAMPONS, small bars of iron, with four spikes fastened to the shoes of those who traverse the glaciers of Chamouny in Switzerland.

CRAMPOONS, **CRAMPONS**, pieces of iron hooked at the ends: for the drawing or pulling up of timber, stones, &c.

CRANA, in *Ancient Geography*, a town of the Peloponnesus, in Arcadia. Theophrastus mentions this place, and says, that its environs abounded with fir-trees.

CRANACH, or **KRANACH**, **LUCAS**, in *Biography*, a painter and engraver, born in 1474 at Cranach, a town in the bishopric of Bamberg, in the circle of Westphalia. His family name is said by some to have been Sunder, by others Muller. Lucas was instructed by his father in the first principles of painting, and made such progress in the art, that at an early age he was appointed painter to the elector of Saxony. He continued in the service of three succeeding electors, but was particularly attached to John Frederic, surnamed the *Magnanimous*, who, whilst in captivity, took great pleasure in seeing him paint.

Towards the decline of life, Cranach retired from the court of Saxony, and took up his abode near his friend Luther, at Wittenberg, where he was made burgomaster. His magisterial functions, however, did not prevent his frequently residing at Weimar, in which town he died in the year 1553, leaving a son of the same name, who succeeded him in the situation of burgomaster. Lucas Cranach, the younger, was likewise a painter; but he was still more distinguished as a literary character. He died in 1586, aged 71.

The pictures of Cranach consist of historical representations, allegories, and portraits; but his works of the two former kinds, though they evince fertility of invention, and a considerable share of expression, lose much of their esteem by the very Gothic and dry style in which they are drawn and executed. His portraits are admired for their great truth of character, and the freshness and beauty of their carnations, notwithstanding the incorrectness with which they are drawn, and the entire want of economy in the management of the lights and shadows. In these countries,

however, he is best known by his numerous engravings; the greater part of which are executed on wood, though there exist a few by him, very rare, on copper. We shall only mention the following:

On wood.

1. The Passion of our Saviour, 13 pieces, small folio, 1509.
2. Three prints of Tournaments, folio, 1509.
3. Martyrdoms of the Twelve Apostles, 12 spirited compositions, 4to. 1549.
4. Portrait of Luther, a whole figure, folio.
5. Ditto, Melancthon, ditto, ditto.

On Copper.

Adam and Eve in the desert. She is sitting at the foot of a rock, the child asleep on her knee. At a distance Adam is represented tilling the earth; in folio, 1509. Very rare.

This artist generally marked his plates with a cypher, composed of the initials of his name, to which he not unfrequently added a dragon, and the arms of Saxony. Huber. Heinecken.

CRANACH, or *Cronach*, and *Gold Cronach*, in *Geography*, anciently called *Crana*, a small town of Franconia in the late bishopric of Bamberg, on the river Cranach, 27 miles E. of Culmbach. It is remarkable for being the place where they held, in ancient times, a bee tribunal, *judicium mellicidorum*.—Also, a river of Franconia, which runs into the Rotach, near Cranach.

CRANAE, in *Ancient Geography*, a small island, in the Laconic gulf, opposite to Gythium. Here it is pretended that Helen gave to Paris the first proofs of affection; and to her ravisher was ascribed the foundations of a temple, built on this continent, and dedicated to Venus Migonitis: whence the adjacent plain has been called Migonium. To the west was mount Larissus, consecrated to Bacchus.

CRANAGE, a liberty to use a crane, for drawing up wares out of a ship, or loy, &c. at a wharf; and to make profit thereof.

The word also signifies the money taken, or paid for the fame.

CRANAOS, in *Ancient Geography*, a town of Asia Minor, in Caria.

CRANBERRY, in *Botany*. See **VACCINIUM oxycoccos**.

CRANBERRY, in *Geography*, a thriving town of America, in the state of New Jersey and county of Middlesex; 9 miles E. of Princeton, and 16 S. S. W. of Brunswick. It contains a handsome Presbyterian church, and a variety of manufactures is carried on by its industrious inhabitants. The stage from New York to Philadelphia passes through Albany, this town, and thence to Bordertown.

CRANBERRY islands lie on the coast of the district of Maine. See **MOUNT DESERT Island**.

CRANBORNE, a small market-town near the north-east confines of Dorsetshire, England, was famous in the Saxon and Norman times for "its monastery, chase, and lords." About the middle of the tenth century, the manor belonged to a noble soldier, named Hayward de Meau, from his pale or fair complexion. His grandson, Brietricus, was sent ambassador into Norway, where, refusing to marry Matilda, afterwards queen to William the Conqueror, she was so provoked at this affront, that when her husband came to the crown of England, she procured an order to seize Brietricus at his mansion or castle, at Stanley in Wiltshire.

cestershire." After the conquest, this manor was granted to Matilda, and on its reversion to the crown at her death, was given by William Rufus to his cousin Robert Fitz-Hamon. On this spot a benedictine monastery was founded about the year 980. The priory church is now the parish church, and one of the oldest in the county. It contains several monuments of the Hooper family. The priory-house was pulled down in 1703. "Cranbourne," says Leland, "is a praty thorough fair, and hath one street meetly welle builded. There renneth a sleting bek thorough it, and passed down thorough the street self, on the right hond." The parish of Cranbourne is the largest in the county, being about thirty miles in circumference, and twelve in length. It contains 337 houses; and 1402 inhabitants: most of the lower class are employed in husbandry. The distance from London is 93 miles S.W. The market is held on Friday.

At a small estate, half a mile south of Cranbourne, was born the eminent Edward Stillingfleet, bishop of Worcester, who died in 1699.

The Roman road, called the Via Icenia, enters Dorsetshire, in the vicinity of Cranbourne, and may be traced to Badbury. Near Woodyate's inn, to the north-east, it is crossed by a high vallum, and ditch, called Ghrimes's ditch, which begins a little west of Grovely in Wiltshire; and passing near Chickbury, Broad chalk, and Woodyates, goes thence in a south-east direction to the Stour, not far from Christ-church in Hampshire. Hutchins's History of Dorsetshire, 2 vols. fol. Maton's Western Counties, 2 vols. 8vo.

CRANBROOK, a vicarage in Kent, in the lathe of Seray. The situation of its steeple was ascertained in the government trigonometrical survey in 1796, by an observation from Goudhurst steeple, distant 18,239 feet, and bearing $71^{\circ} 8' 27''$ N.W. from the parallel to the meridian of Greenwich; and another from Hartridge, distant 9439 feet: whence was calculated its latitude $51^{\circ} 5' 50''$ N., and its longitude $0^{\circ} 32' 10''$, or $2' 8'' 7$ E. of Greenwich.

CRANDORF, a small town of Saxony, in the circle of the Ertzgebirge, the inhabitants of which are chiefly miners in the iron mines at Rothenberg.

CRANE, in *Astronomy*, the name of a southern constellation. See GRUS.

CRANE, in *Hydraulics*, a popular name for a *Siphon*; which see.

CRANE, in *Mechanics*, a machine used in *Building* and in *Commerce*, for raising large stones, and other weights, to certain heights, or lowering them to certain depths.

M. Perrault, in his notes on Vitruvius, makes the crane the same with the *corvus*, or raven, of the ancients.

The modern crane consists of several members, or pieces, the principal being a strong perpendicular beam, or arbor, firmly fixed in the ground, and sustained by eight arms, coming from the extremities of four pieces of wood laid across, through the middle of which the foot of the beam passes. About the middle of the arbor the arms meet, and are mortised into it: its top ends in an iron pivot, on which is borne a transverse piece, advancing out to a good distance in manner of a crane's neck; whence its name. The middle and extremity of this are again sustained by arms from the middle of the arbor: and over it comes a rope, or cable, to one end of which the weight is fixed; the other is wound round the spindle of a wheel, which turned, draws the rope, and that heaves up the weight; to be afterwards applied to any side or quarter, by the mobility of the transverse piece on the pivot.

There are several improvements of this useful machine mentioned in Desaguliers's *Experim. Philos.* p. 178, *seq.* particularly how to prevent the inconveniences arising from sudden jerks, as well as to increase its force by using a double axis in *peritrochio*, and two handles.

The crane is of two kinds; in the first kind, called the *rat-tailed crane*, the whole machine, with the load, turns upon a strong axis: in the second kind, the gibbet alone moves on its axis. We shall refer to Desaguliers, *ubi supra*, for a particular account of different cranes, and recte improvements in the construction of them: beginning with a description of one, in which most of them are combined, invented by the late Mr. Padmore of Bristol. This consists of wheels, axles, pulleys, ropes, and a gib or gibbet. *Plate XVIII. Mechanics, fig. 2.* When the rope, H, is hooked to the weight K, a man turns the winch A, on the axis of which is the trundle B, which turns the wheel C, on whose axis, D, is the trundle E, which turns the wheel F, with its upright axis G, on which the great rope, H H, winds as the wheel turns; and going over a pulley, I, at the end of the arm, *d*, of the gib *c c d e*, it draws up the heavy burden K; which, being raised to a proper height, as from a ship to the quay, is then brought over the quay by pulling the wheel, Z, round by the handles *z, z*, which turns the gib by means of the half wheel, *b*, fixed on the gib-post *c c*, and the strong pinion, *a*, fixed on the axis of the wheel Z. This wheel gives the man that turns it an absolute command over the gib, so as to prevent it from taking any unucky swing, such as often happens when it is only guided by a rope tied to its arm *d*; and people are frequently hurt, sometimes killed, by such accidents.

The great rope goes between two upright rollers *i* and *k*, which turn upon gudgeons in the fixed beams *f* and *g*; and as the gib is turned towards either side, the rope bends upon the roller next that side. Were it not for these rollers, the gib would be quite unmanageable; for the moment it were turned ever so little towards any side, the weight, K, would begin to descend, because the rope would be shortened between the pulley I, and axis G; and so the gib would be pulled violently to that side, and either be broke to pieces, or break every thing that came in its way. These rollers must be placed so, that the sides of them, round which the rope bends, may keep the middle of the bended part directly even with the centre of the hole in which the upper gudgeon of the gib turns in the beam *f*. The truer these rollers are placed, the easier the gib is managed, and the less apt to swing either way by the force of the weight K.

A ratchet-wheel, Q, is fixed upon the axis D, near the trundle E; and into this wheel falls the catch or click R. This hinders the machine from running back by the weight of the burden K, if the man who raises it should happen to be careless, and so leave off working at the winch, A, sooner than he ought to do.

When the burden, K, is raised to its proper height from the ship, and brought over the quay by turning the gib about, it is let down gently upon the quay, or into a cart standing thereon, in the following manner. A man takes hold of the rope *tt*, (which goes over the pulley *u*, and is tied to a hook at S, in the catch R,) and so disengages the catch from the ratchet wheel Q; and then, the man at the winch, A, turns it backward, and lets down the weight K. But if the weight pulls too hard against this man, another lays hold of the handle V, and by pulling it downward, draws the gripe, U, close to the wheel Y, which, by rubbing hard against the gripe, hinders the too quick descent of the weight; and not only so, but even stops it at any time,

C R A N E.

if required. By this means, heavy goods may be either raised or let down at pleasure, without any danger of hurting the men who work the engine.

When part of the goods is craned up, and the rope is to be let down for more, the catch, R, is first disengaged from the ratchet-wheel Q, by pulling the cord *t*; then the handle, *q*, is turned half round backward, which, by the crank, *nn*, in the piece *o*, pulls down the frame, *b*, between the guides *m* and *m*, (in which it slides in a groove,) and so disengages the trundle, B, from the wheel C: and then, the heavy hook, *β*, at the end of the rope, H, descends by its own weight, and turns back the great wheel, F, with its trundle, E, and the wheel C; and this last wheel acts like a fly against the wheel, F, and hook *β*; and so hinders it from going down too quick; whilst the weight, X, keeps up the gripe, U, from rubbing against the wheel Y, by means of a cord going from the weight, over the pulley, *ω*, to the hook, W, in the gripe; so that the gripe never touches the wheel, unless it be pulled down by the handle V.

When the crane is to be let at work again, for drawing up another burden, the handle, *q*, is turned half round forwards; which, by the crank *nn*, raises up the frame *b*, and causes the trundle, B, to lay hold of the wheel C; and then, by turning the winch A, the burden of goods, K, is drawn up as before.

The crank, *nn*, turns pretty stiff in the mortise near *o*, and stops against the farther end of it when it has got just a little beyond the perpendicular; so that it can never come back of itself: and therefore, the trundle, B, can never come away from the wheel C, until the handle, *q*, be turned half round backward.

The great rope runs upon rollers in the lever LM, which keep it from bending between the axle at G and the pulley I. This lever turns upon the axis, N, by means of the weight O, which is just sufficient to keep its end, L, up to the rope; so that, as the great axle turns, and the rope coils round it, the lever rises with the rope, and prevents the coilings from gnawing over one another.

The power of this crane may be estimated thus: suppose the trundle, B, to have 13 flaves or rounds, and the wheel, C, to have 78 spur cogs; the trundle, E, to have 14 flaves, and the wheel, F, 56 cogs. Then, by multiplying the flaves of the trundles, 13 and 14, into one another, their product will be 182; and by multiplying the cogs of the wheels, 78 and 56, into one another, their product will be 4368, and dividing 4368 by 182, the quotient will be 24; which shews that the winch, A, makes 24 turns for one turn of the wheel, F, and its axle, G, on which the great rope or chain, H I H, winds. So that, if the length or radius of the winch, A, were only equal to half the diameter of the great axle G, added to half the thickness of the rope H, the power of the crane would be as 24 to 1: but the radius of the winch being double the above length, it doubles the said power, and so makes it as 48 to 1: in which case, a man may raise 48 times as much weight by this engine as he could do by his natural strength without it, making proper allowance for the friction of the working parts. Two men may work at once, by having another winch on the opposite end of the axis of the trundle under B; and this would make the power double.

If this power be thought greater than what may be generally wanted, the wheels may be made with fewer cogs in proportion to the flaves in the trundles; and so the power may be of any degree that is judged to be requisite. But if the weight be so great as will require yet more power to raise it (suppose a double quantity), then the rope, H, may be put under a moveable pulky, as *β*, and the end of it tied to

a hook in the gib at *t*; which will give a double power to the machine, and so raise a double weight hooked to the block of the moveable pulley.

When only small burdens are to be raised, this may be quickly done by men pushing the axle, G, round by the handspikes *y, y, y, y*; having first disengaged the trundle, B, from the wheel C: and then, this wheel will only act as a fly upon the wheel F; and the catch, R, will prevent its running back, if the men should inadvertently leave off pushing before the burden be unhocked from *β*.

Lately, when very heavy burdens are to be raised, which might endanger the breaking of the cogs in the wheel F; their force against these cogs may be much abated by men pushing round the handspikes *y, y, y, y*, whilst the man at A turns the winch. Ferguson's Lectures on Select Subjects, 4to. p. 52, &c.

If the axis, G G, be placed horizontally, and instead of the wheel, F, a larger wheel be fixed to it, which may be turned by men walking in it, we shall have another kind of crane; the rope will coil round the axle as the wheel turns, and the gib-work is the same as in the other sort of crane. Mr. Padmore contrived to prevent the danger attending the use of this construction, by putting cogs all round the outside of the wheel, and applying a trundle to turn it; by which addition the power is increased in the proportion of the number of cogs to the number of flaves in the trundle: and in order to hinder its running back by the force of the weight, should the men within it slip, or leave off walking, he added a ratchet-wheel to the axis of the trundle, like that already described. Two winches may also be fixed to the ends of the axle, by working which the men in the wheel would be much assisted. On the axle of the trundle he likewise fixed a gripe-wheel, such as has been already described, by means of which heavy burdens may be let down without the least danger.

Mr. Ferguson has contrived and described a new and safe crane, with four different powers adapted to different weights; for which he received a reward of 50*l.* from the Society for the encouragement of arts, &c. In this crane (see Plate XVIII. *Mechanics*, fig. 3.) A represents the great wheel, and B its axle, on which the rope, C, winds. This rope goes over a pulley, D, in the end of the arm of the gib E, and draws up the weight F, as the winch, G, is turned round. H is the largest trundle, I the next, and K is the axis of the smallest trundle, which is supposed to be hid from view by the upright supporter L. A trundle, M, is turned by the great wheel, and on the axis of this trundle is fixed the ratchet-wheel N, into the teeth of which the catch, O, falls. P is the lever, from which goes a rope, Q Q, over a pulley, R, to the catch; one end of the rope being fixed to the lever, and the other end to the catch. S is an elastic bar of wood, one end of which is screwed to the floor: and, from the other end goes a rope (out of sight in the figure) to the farther end of the lever, beyond the pin or axis on which it turns in the upright supporter T. The use of this bar is to keep up the lever from rubbing against the edge of the wheel U, and to let the catch keep in the teeth of the ratchet-wheel: but a weight hung to the farther end of the lever, would do full as well as the elastic bar and rope.

When the lever is pulled down, it lifts the catch out of the ratchet-wheel, by means of the rope Q Q, and gives the weight, F, liberty to descend: but if the lever, P, be pulled a little farther down than what is sufficient to lift the catch, O, out of the ratchet-wheel N, it will rub against the edge of the wheel, U, and thereby hinder the too quick descent of the weight; and will quite stop the weight, if pulled hard. And if the man who pulls the lever should happen inad-

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vertently to let it go; the elastic bar will suddenly pull it up, and the catch will fall down and stop the machine.

W, W, are two upright rollers, above the axis or upper gudgeon of the gib E: their use is to let the rope, C, bend upon them, as the gib is turned to either side, in order to bring the weight over the place where it is intended to be let down: which rollers ought to be so placed, that if the rope, C, be stretched close by their outmost sides, the half thickness of the rope may be perpendicularly over the centre of the upper gudgeon of the gib; for then the length of the rope between the pulley in the gib and the axle of the great wheel, will be always the same, in all positions of the gib, and the gib will remain in any position to which it is turned.

The powers of this machine may be easily calculated: the horizontal-wheel has ninety six cogs, the largest trundle twenty-four staves, the next largest has twelve, and the smallest has six. So that the largest trundle makes four revolutions for one revolution of the wheel; the next makes eight; and the smallest makes sixteen. When a winch is occasionally put upon the axis of either of these trundles for turning it, the handle of the winch describes a circle in every revolution equal to twice the circumference of the axle of the wheel; and therefore the length of the winch doubles the power gained by each trundle. So that if the winch be applied to the axle of the largest trundle and turned four times round, the wheel and axle will be turned once round, and the power will move through eight times as much space as the weight rises through: in which case the power will be to the weight as eight to one; *i. e.* a man may raise (allowing for friction) eight times as much weight by the crane, as he might by his natural strength without it. If the second trundle be used, the proportion of the power to the weight will be as sixteen to one; and with the smallest trundle, as thirty-two to one. The power may again be doubled by drawing up the weight by one of the parts of a double rope, going under a pulley in the moveable block, which is hooked to the weight below the arm of the gib; for then the power will be as sixty-four to one: and by increasing the number of pulleys, the power will be proportionably increased. See Supplement to Ferguson's Lectures, p. 3, &c. or Phil. Transf. vol. liv. art. 3, p. 24.

An improved crane for wharfs has lately been invented by Mr. Robert Hall of Bastord, near Nottingham, who was rewarded with 40 guineas by the Society of Arts. The invention chiefly consists in expanding a set of bars parallel to the axis of a crane, by means of which the velocity of the ropes in raising weights may be diminished or increased, in proportion to the load which is to be raised. An engraving and description of this crane may be seen in the 12th volume of the Transactions of the Society, p. 283, &c. We have already observed under the article CAPSTAN, that the capstan with a compound barrel, consisting of two cylinders of different radii, may be converted into a crane or windlass for raising weights. Such a crane is evidently superior to those in common use, with the additional advantage of allowing the weight to stop in any part of its progress, without the aid of a ratchet-wheel and catch, as the two parts of the rope pull on contrary sides of the barrel. The rope, indeed, which coils round the larger part of the barrel, acts with a longer lever, and consequently with greater force than the other; but as this excess of force is not sufficient to overcome the friction of the gudgeons, the weight remains stationary in any part of its path. A crane of this kind was erected, in 1797, at Bordenton in New Jersey, by Mr. M'Kean, for the purpose of raising logs of wood to the frame of a saw-mill, 10 feet distant from the ground.

We are happy here to lay before the public a design for a crane, by the late Mr. John Smeaton, through the liberality of sir Joseph Banks, who kindly permitted our draughtsman to make a reduced copy of the original drawing, which he purchased, with many others, since the demise of Mr. Smeaton. The machine was erected at the wool quay custom-house, London, in 1789. *Fig. 2, (Plate XIX. Mechanics)* is a plan of it; *fig. 3*, an elevation; and *fig. 1*, a section of the barrel: the same letters of reference are used in each figure. A is the barrel upon which the chain is wound; it has seven turns of a spiral groove cut upon it, to receive the lower-half of the links of the chain, as will be clearly understood from *fig. 3*; *a, a, fig. 2*, are two of four handles (the others not being shown) screwed to the end of the barrel by long bolts going through its whole length, as shewn in *fig. 1*; the other ends of the same bolts attach to the barrel, a wheel, B, with hooked teeth. The barrel, with its wheel, B, and handles, has a metal bush driven into its centre, and well fitted to a nicely turned arbor, *b*, in the section, *fig. 1*, so as to turn upon it freely without shake. This arbor has a shoulder, C, upon it truly turned, against which the great wheel, D, fits, and is held fast to it by four screws (*fig. 2*); the great wheel, D, and barrel are connected together by means of two clicks, *d, d, (fig. 3)* turning on pins made fast to the wheel, and pressed by springs into the teeth of the ratchet-wheel B. The great wheel, D, has 96 teeth, and is turned by a lantern, E, of 11 staves, on the arbor *f*. F is a fly-wheel fitted on the same arbor by a shoulder, in the same manner as the great wheel. G is a broad wooden wheel on the arbor, *f*, encompassed half round by a brake, *g*, formed of four pieces; it is brought to touch the wheel by a foot lever, H, *fig. 3*, and a weight at the opposite end of the lever lifts it off the wheel when not in use. I is a ratchet-wheel, and *i* the click to prevent the crane running back; K, K, are the winches by which it is turned. The ratchet and click on the barrel are used when the crane is lowering goods, and the chain is to be drawn up with any work; the workmen then turn the barrel by the four handspikes, *a, a*, the sloping sides of the ratchet-wheel lifting up the clicks, *d, d*, and passing by, without the labour and loss of time of turning the wheels; and likewise, when the crane is used for raising goods, and the chain is to be let down without any load, the barrel must be turned back a small space, and the clicks disengaged, by pushing one of their tails, *n* or *n*, for which purpose they are connected to move together by a small rod *o*; the barrel then runs down by the weight of the chain, and if that is not sufficient, the workman assists it by the handspikes, *a, a*. The contrivance of the grooved barrel is of very great use, as without it the chain lies in such a manner that the action of the load tends to twist open the links laterally. Mr. Gilbert Gilpin of Shifnal was rewarded by the Society of Arts, in 1803, for the same invention, without perhaps knowing Mr. Smeaton had applied it before him. As he has very well explained the advantages of this construction, we shall make use of his own words from the Transactions of the Society, vol. ii. p. 3.

Every chain formed of oval links has a twist in itself, arising from a depression given by the hammer to each link in the welding: the twist may be seen by holding the piece of the chain by one end, and viewing the links edgewise as it hangs down; and this circumstance, so trifling in appearance, is not so in its effects; and it has in consequence a perpetual tendency (even when reefed perfectly straight in pulleys, and on the barrels of cranes) to assume a spiral form, which a plain cylindrical barrel, and the common pulleys with semi-circular grooves, are not in the least calculated to prevent. Hence the alternate links of the chain, in coiling round a barrel,

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barrel, or working over pulleys, form obtuse angles in assuming the spiral form, bearing upon the lower parts of their circumferences, and forming as it were two levers, which wrench open and crush each other in proportion to the weight suspended, as well as prevent the freedom of motion in the links themselves, and thereby load the chain with additional friction.

A still greater obstruction to the uniformity of its motion, is the tendency which the chain has to make a double coil, as it approaches the middle of the barrel, and crosses its centre, and that of the pulleys at right angles, by means of which the chain is frequently broken by the sudden jerk, caused by the upper coil slipping off the undermost.

It is to these causes that all the accidents that occur to workmen and machinery, from the failure of chains, may be attributed, (bad iron excepted,) and which form the sole objection to their becoming a general substitute for ropes.

As a preventive to these evils, says this writer, I have grooves cast in iron pulleys, of sufficient dimensions to receive the lower circumferences of the links of the chain, which work vertically: those which work horizontally and form the gudgeon part of the chain (if we may be allowed the expression,) bearing up on each side of the grooves.

The barrels are also of cast iron, with spiral grooves of the same dimensions, at such distance from each other as to admit the chain to bed without the danger of a double coil; by these means the links are retained at right angles with each other, the only position for free and uniform motion.

The links of the chains are made as short as possible, for the purpose of increasing their flexibility, and they are reefed perfectly free from twist in the pulleys and on the barrels, for the same reason.

When applied in block, the grooves in the pulleys prevent the different falls of the chain from coming in contact, and render plates between them (as in the common way)

totally unnecessary; the pulleys are in consequence brought closer together, the angle of the fall from block to block considerably diminished, and the friction against the plates entirely avoided. Brass guards, with grooves opposite to those in the pulleys, are rivetted to the blocks, to prevent the chain getting out of its berth from any accidental circumstance. This method of working chains I first put in practice for Messrs. T. W. and B. Botfield, at their works, in July 1803; and it is applied in the working of cranes capable of purchasing from ten to fifteen tons; in the working of the governor balls of steam engines constructed by Messrs. Boulton and Watt, and in the raising of coal and ore from the mines, for which purposes ropes had before been solely used at this manufactory. In all cases it has performed with the utmost safety, uniformity, and flexibility; so much so, that the prejudices of our workmen against chains are entirely done away, and they hoist the heaviest articles with more ease, and as great confidence of safety, as they would with the best ropes.

The same method is applicable, at a trifling expence, to all machines at present worked by ropes, or by chains, in the usual way: and all the common chains now in use, may be applied to it with equal facility.

With a view of ascertaining the relative flexibility of ropes and chains, I wedged an iron pulley, thirty-one and a half inches in diameter, on the spindle of the pinion of a crane of the following description, *viz.*

Barrel, 30 inches diameter.

Wheel, 64 teeth.

Pinion, 8 ditto.

Top block, with three pulleys of 12 inches diameter.

Bottom block, with 2 ditto. ditto.

To the large pulley I attached a small rope, for the purpose of suspending the weights in the hoisting of the different loads, and the results were as follow:

The crane was loaded with,	Took to hoist the loads when reefed with the chain in grooved pulleys. All the experiments were tried with the same grooved pulleys.	Ditto, when reefed with a half-worn tarred strand-laid rope 3½ inches in circumference.	Ditto, when reefed with the chain promiscuously, as in the common way.
	lbs.	lbs.	lbs.
First, - - -	2000	63	80
Second, - - -	1000	32	41
Third, - - -	500	17	22
Total 3500	112	134	143

The flexibility is inversely as these momenta, and proves the superiority of chains; for (on the average of the trials with the chain in the grooves;

One pound raised - - - - - 31.25 lbs.
 With a half-worn strand-laid tarred rope,
 three inches and a half in circumference - - - - - 26.11 ditto.
 And with the chain in the usual way,
 only - - - - - 24.47 ditto.

It also appears (contrary to the general opinion,) that chains are safer than ropes; for it is an established axiom, that those bodies whose fibres are most in the direction of the strain, are the least liable to be pulled asunder; and in our examination of the properties of a rope, we find that the strands cross the direction of the strain in undulated lines,

and consequently prevent its uniform action thereon. A rope is subject to this inconvenience even when stretched in a direct line, but more particularly so when bent over a pulley, as in that position the upper section moving through a greater space than the under one, is acted upon by the whole strain; and hence the frequent breaking of ropes in bending over pulleys, from the double strain overloading the strands of which the upper section is formed.

The links of a chain are subject to the transverse strain, where they move in contact; but as such strain is in proportion to the length of the bearings, it must be very trifling. All the links having axles of their own, the chain moves simultaneously with the strain, and both are in consequence retained in continual equilibrio. A chain in grooves will therefore sustain as great a weight when bent

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over a pulley, as it will in a direct line, and consequently is safer than a rope.

The Society for the encouragement of arts, manufactures, and commerce, having for many years past offered premiums for improvements in cranes, have therefore a large collection of models of different sorts. We have selected 3 of these, and have appropriated *Plate XX. Mechanics*, to the explanation of them. *Figs. 1 and 2*, are two elevations of a walking wheel crane laid before them by Mr. James White of Chevening, Kent, and for which he received a premium of 40 guineas in the year 1796. We have found it necessary to have new drawings made of this machine, as those published by the learned society are taken from the model left with them, and do not explain the manner in which the machine should be constructed.

Figs. 1 and 2, are two elevations of it at right angles to each other. A A is a large wheel, about 16 feet diameter, strongly framed and secured to its axis E, which is mounted upon pivots at its ends and inclined to the horizon in an angle of about 70 degrees, and consequently the plane of the wheel inclines 20 degrees. The rope of the crane is coiled round the axle and passes over a pulley *a*, (*fig. 1.*) to the gib of the crane, which is constructed in the usual method; F is a lever extending across the wheel and fixed at one end into an upright axis; G H is a short lever connected with an iron rod *e*, with a gripe *g*, which embraces part of the circumference of the wheel and prevents its turning, unless removed by pushing the lever F; *b* (*fig. 1.*) is a cord fastened to the gripe lever, and going over a pulley in the floor, having a weight suspended from it; this always gives the gripe a tendency to stop the wheel, and by the weight coming up to the pulley stops the gripe lever from going too far, when pressed by a man walking on the wheel. The wheel is turned by a man walking on the wheel and pushing the gripe lever F, so as to release the wheel which then turns (if the load be not too great) both by his weight and muscular exertion applied against the gripe lever.

The wheel is supposed to be erected in a warehouse, and an opening is made in the floor to allow the wheel to pass through. The man walks from the floor at *k*, up the wheel, which will always be at rest, unless he relieves it by pushing the lever F. The end, *l*, of the gripe is jointed to a stout upright beam going from the floor to the ceiling of the room where the crane is erected, and the rest of the gripe should be hung by small cords from the ceiling to prevent its falling down and getting from its work.

The properties of this crane are as follow: its simplicity consisting of a mere wheel and axle. Secondly, its only friction, exclusive of the pulleys, is that on the two gudgeons of the shaft; and one of these supports the weight of the wheel, and of the man that works it, nearly in the direction of its point. Thirdly, it is durable, as is evident from the two properties above-mentioned. Fourthly, it is safe, for it cannot move but during the pleasure of the man, and while he is actually pressing on the gripe-lever. Fifthly, this crane admits of an almost infinite variety of different powers; and this variation is obtained without the least alteration of any part of the machine. If, in unloading a vessel, there should be found goods of every weight, from a few hundreds to a ton and upwards, the man that does the work will be able so to adapt his strength to each as to raise it in a space of time proportionate to its weight, he walking always with the same velocity as nature and his greatest ease may teach him. It is a great disadvantage in some cranes, that the smallest weight must be as long in rising

as the largest, unless the man turn or walk with a greater velocity, which tires him in still greater proportion.

In other cranes, perhaps, two or three different powers may be procured; to obtain which, some pinion must be shifted, or fresh handle, applied or resorted to. In this crane, on the contrary, if the labourer find his load so heavy as to permit him to ascend the wheel without its turning, let him only move a step or two toward the circumference, and he will be fully equal to the task. Again, if the load be so light, as scarcely to resist the action of his feet, and thus oblige him to run through so much space, as to tire him beyond necessity, let him move laterally towards the centre, and he will soon feel the place where his strength will suffer the least fatigue, by raising the load in question.

It has been before observed, that, if left alone, this crane will naturally reduce itself to a state of rest, even though a weight were suspended to it. The means will appear to be the gripe, or brake at the top, and its lever, which stretches across the diameter of the wheel, at the height of a man's breast, when in an attitude of treading the wheel to the best advantage.

The next crane of the Society's which we shall describe, is one for which Mr. John Braithwaite received their gold medal. The description published in the *third volume* of their Transactions, is as follows:

The frame, which is wholly of cast-iron, is formed of two circles, held together by three screwed bars, and standing on four feet; the crane wheel, which is inclosed within the frame, consists of three concentric toothed face-wheels, joined together by strong bars, whose axle is the barrel, on which the rope is coiled; in the front of the face-wheels runs a shifting arbor; on this arbor is a pinion, which may be brought to work in the teeth of either of the face-wheels, and thereby the power employed at the winch may be applied to raise a greater or lesser weight occasionally. ABCDE, *figs. 3 and 4*, is a frame of cast iron; F, G, H, three concentric face-wheels, united together by the eight straight bars, *a, a, a*; I K a sliding arbor, on which is fixed a pinion L; M the winch or handle; N a stop, which, when lifted up, permits the sliding arbor to be moved backward or forward; but, when down, retains it in its proper place; O a pall, or stop, which prevents the crane running back, but may be discharged at pleasure; P the barrel on which the rope is coiled.

We think a great improvement might be made in this machine, by putting on the arbor, I K, three pinions, one for each wheel; they should all be put loose upon the arbor, but either of them may be easily fixed to turn with it by a sliding coupling iron; which will only admit of one being engaged at a time. The wheels might then be beveled, which are found, by experience, to work better than the face-wheels; and the sliding of the arbor obliges it to be of greater length than necessary, and more liable to be strained or bent; we have seen such a contrivance in other machines which acted very well.

Fig. 5, is a contrivance of Mr. Joseph Dixon, for which the Society presented him with 15 guineas in 1793, which he calls a preservative-wheel; it is intended to be applied within-side of an ordinary vertical wheel, where the men walk in the inside, to prevent the danger to which they are continually exposed, by the load being too great for them; the wheel then runs back, and throws them about in the wheel, and frequently kills them. A E is the axis, or spindle of the walking-wheel; the arms are mortised into it at *aa*; E is the part where the crane-rope winds; B, B, are two wheels fixed on the axis, and having at their peripheries six pulleys,

over which ropes run, that are fastened at their extremities to two segments of circles C, C; these are united together by a wooden bar D, which the men are to lay hold of and suspend themselves by in case of danger.

This machine would completely obviate the danger to which the men who work in these wheels are exposed, but it would, at the same time, increase the danger to those employed in other parts, as the men within the wheel would, by hanging themselves to the bar D, remove all obstructions to the wheel's motion, and, without some other contrivance of a brake-lever, the wheel would run down so rapidly by the action of the load as to expose those at the gib, and other parts, to great danger.

Mr. Ferguson contrived a crane (already described) to remove the same defect, where the walking-wheel had a ring of cogs round its outside, working into a pinion, on whose axis was a brake and ratchet-wheel, with a winch at the end for the man who managed the brake to assist occasionally in raising the load. But the rapid motion of the circumference of these large wheels, in most cases, renders this contrivance inapplicable, unless a smaller cog-wheel was fixed upon the same axis with the walking-wheel.

Fig. 1, of Plate XXI. is a gib for a crane invented by Mr. Bramah, and described by him in Nicholson's Journal, 8vo. vol. viii. p. 99. The support for the gib is a hollow pipe or column, A, firmly fixed by a square flanch, bolted to beams in the ground, and the rope for the crane passes through this pillar. The gib of the crane has two sockets, *a, a*, fitting to the pillar, so that it can turn all round. A pulley, *b*, is fixed on the back of the gib and its edge hangs just over the centre of the column: *d* is the pulley at the end of the gib. The crane rope, after going over the pulleys *b, d*, passes down the column, and goes round another pulley, to convey it to the crane-work, which may be of any of the kinds we have described.

Fig. 2, is a very good kind of crane, as it requires no framing over it; it turns round upon a strong vertical beam, A B, moving between rollers fixed in the floor of the wharf at B, and going down below that 12 or 14 feet, where it works on a pivot. The beams of the gib are mortised into the beam A B; the wheels are mounted in a frame formed by two cast iron crosses bolted to the beam, one on each side; the barrel is one foot diameter; the great wheel has 100 teeth, and is four feet diameter; the second wheel has 31 teeth; and the last pinion seven leaves. The winches can be applied to any of the wheels for different powers, when it is used on the barrel, or second wheel; the others are put out of gear by sliding their spindles endways. The barrel and pulleys should always be grooved, as in Mr. Smeaton's crane, where chains are used, though this is not sufficiently attended to by Mechanics.

Fig. 3, represents the tongs by which logs of timber are taken up with a crane, and the greater weight they bear the better they hold. Figs. 4 and 5, are two elevations of a crane by Mr. Valentine Gotlieb of Lambeth Marsh, London. The barrel, A, has a wheel fixed to it at each end; one, *a*, has 96 teeth, the other 90; *b* is an arbor with two pinions on it of eight teeth for the wheel 96, and another of 14 for the wheel 90; these pinions are at a smaller distance apart on their arbor than the two wheels, so that they cannot be both engaged to the wheel at once, and by sliding it an end either wheel and pinion may be used for different work; *e, f*, are two stops to hold it in either one; *b* is a fly on the same arbor *b*, and *e* the handle. The original part of the crane is the gib; it is a large beam, H, placed hori-

zontally, and running upon a roller at *k*, and its other end kept down by another at *l*; it has a pulley at its outer end, over which the rope passes. The underside of the beam is cut into teeth, forming a rack, and a pinion of eight leaves, on the same arbor as the wheel *m*, moves the beam, so as to bring the goods suspended from its end into the house. H is the wall of the warehouse, and the wheels are supposed to be placed in the roof. The wheel *m*, and the fly wheel, have endless ropes going round them to work the crane by, in the room below, if necessary.

CRANE, in *Ornithology*, the *ARDEA grus* of Linnæus and Gmelin. For an account of the birds that are referred to this class or division in the arrangement of Gmelin; see GRUEL. For other species of the *Ardea*, see CICONIA and STORK, CRISTATÆ, and HERONS.

CRANE'S bill, a kind of forceps used by surgeons, and so named from its figure.

CRANE'S-bill, in *Botany*. See ERODIUM, GERANIUM, PELARGONIUM.

CRANE-fly, a name given by some to the creature we commonly call *father long-legs*; and the authors of histories of insects, *TIPULA terrestris*. This creature affords the microscopic observers many curious particulars; but the most remarkable is, the surprising contraction of the muscular fibres in the legs. These being dissected in a drop of water, and placed before the microscope, the fleshy fibres contract and distend themselves in a manner not to be imagined, and continue this motion for several minutes; and this is constantly to be observed in this insect, and never in any other, so far as has been yet observed. Leewenhoeck, *Arcan. Nat.* tom. iii. p. 109.

The intestines of this creature are also very wonderful, consisting of numberless vessels and organs, which may be seen as plainly by the microscope, as the bowels of larger animals can by the naked eye. The tails both of the male and female are also of an amazing structure; the female's ends in a sharp point, with which she perforates the ground, and deposits her eggs under the grass in meadows.

CRANE lines, in a ship, are lines going from the upper end of the sprit-fail-top-mast, to the middle of the fore-stays; serving to keep the sprit-fail-top-mast upright and steady.

CRANE-neck of a carriage. See COACH.

CRANENBOURG, in *Geography*, a small town of France, in the department of the Roer, chief place of a canton in the district of Cleves. It has only 955 inhabitants. The canton itself contains fifteen communes, with a population of 4641 individuals. The town formerly belonged to the Prussian duchy of Cleves in Westphalia, which at present forms part of the department of the Roer.

CRANEQUINIERS, or CRANEQUIERS, in *Military Language*. Before the invention of gunpowder this name was given to soldiers who were armed with bows, and made use of an instrument called *Cranequin* for bending them. The dukes de Bourgoigne had usually six hundred cranequiniers in their suite.

CRANEY, in *Geography*, a small island on the S. side of James river, in Virginia, at the mouth of Elizabeth river, and 5 miles S.W. of Fort George, on Point Comfort. It commands the entrance of both rivers.

CRANFIELD, a rectory in Bedfordshire, in the hundred of Redbornstoke: this village is situate upon strong clay land, and is remarkable for the deep and miry state of its roads, although its situation is very high: the spire on its steeple is a very commanding object, whose place was determined by the government trigonometrical survey in 1799, by an observation from Bowbrich-hill station, distant

tant 29,599 feet, and bearing $30^{\circ} 44' 22''$ S.W. from the parallel to the meridian of Greenwich, and another from Lidington-park station, distant 19,526 feet, whence is deduced its latitude $52^{\circ} 4' 3''$ N. and its longitude $0^{\circ} 36' 11''$ E. or $2^{\circ} 24' 7''$ W. of Greenwich

CRANFIELD-point is the N. point of the entrance into Carlingford bay on the east coast of Ireland. N. lat. 54° W. long. $6^{\circ} 0' 30''$.

CRANGANORE, a town of India, in the country of Cochín, on the coast of Malabar, with an irregular fortress built by the Portuguese, from whom it was taken by the Dutch in 1662; the Dutch sold it in 1789 to the rajah of Travancore; which caused a war between the English and Tippoo Sultan, king of the Mysore, who disputed the right of the Dutch to dispose of it. It was taken by Hyder Ali, and retaken by the English in 1790. N. lat. $10^{\circ} 23'$. E. long. $75^{\circ} 58'$.

CRANGEN, a small town of Prussia, in Ulterior Pomerania, with a castle, situated on the river Grabow.

CRANGON, in *Entomology*. See *CANCER Aftacus*.

CRANIA, in *Ancient Geography*, a mountain of Greece, in Etolia, near the city of Ambracia, according to Pliny. This mountain gave name to a country. Steph. Byz.

CRANICHIS, in *Botany*. Schreb. 1374. Swartz. Prod. 120. Swed. Transf. 1800. p. 113. Class and order, *gynandria monandria*. Nat. Ord. *Orchidæ*, Linn. Juss.

Gen. Ch. Cal. Spathes vagæ. Perianth none. Cor. reflexate, somewhat ringent. Petals five; three exterior; two of them lateral, superior; one anterior, inferior; nearly equal, erect, spreading; two lateral, interior, scarcely less: lip of the nectary (uppermost in situation) between the lateral superior petals, vaulted, egg-shaped, somewhat keeled, often bifid at the base, tender, covering the parts of fructification. Stam. Anther parallel to the style, affixed behind, erect, acuminate, two-celled; pollen masses oblong, nearly sessile, pulverulent. Pist. Germ inferior, egg-shaped, oblique; style erect, dilated in the middle, membranous at the tip, acuminate; stigma before (towards the lip) somewhat concave. Peric. Capsule oblong or inversely egg-shaped, attenuated at the base, trigonous, three-keeled, one celled, opening under the ribs, covering at the tip and base. Seeds numerous, very small, like saw-dust, affixed to a columnar receptacle.

Ess. Ch. Corolla reflexate, somewhat ringent. Lip of the nectary vaulted. Anther parallel to the style, affixed behind, erect, acuminate, two-celled.

Sp. 1. *C. aphylla*. Swartz, fl. ind. occid. 3. 1421. "Without leaves; roots fascicled, cylindrical, acute; stem roundish; petals connivent." 2. *C. diphylla*. "Roots fascicled, filiform, naked; leaves in a pair, petioled, heart-shaped, acute; stem almost naked." 3. *C. oligantha*. "Roots fascicled, c b-shaped; leaves petioled, oblong, acuminate, thinning; stem nearly naked; spike filiform; petals connivent." 4. *C. stachyodes*. "Roots fascicled, cylindrical, obtuse; leaves petioled, egg-shaped, acuminate; stem sheathed; petals revolute." 5. *C. muscosa*. "Roots fascicled, filiform, tomentous; root-leaves petioled, egg shaped; stem ones sheathing; lip dotted within. 6. *C. pauciflora*. "Roots fascicled, cylindrical, villous; leaves nearly sessile, oblong, acute; stem few-flowered, pubescent at the top. All the species are natives of Jamaica.

CRANII, in *Ancient Geography*, a town of the island of Cephalenia, situated towards the west in a small gulf.

CRANIOLARIA, in *Botany*, Linn. See *MARTYRIA* and *GESNERIA*.

CRANIOLARIS, in *Natural History*, a species of *Amonia*, with an orbiculated shell, found very rarely in the Mediterranean sea, and near the Philippine isles; more frequently fossil. Also a species of *ECHINUS* found in India.

CRANIOLOGY is one of the terms used by Dr. Gall of Vienna, and his followers, in order to denote their doctrine concerning the form of the cranium as connected with the different faculties of the mind, and with the passions and propensities that characterize different individuals.

The science of craniology, in the above-mentioned sense, is of very recent origin; but it has so strongly attracted the attention of the public, particularly on the continent, where it was first promulgated, that we think it necessary to exhibit, in the present work, a view of the real or pretended discoveries which have been made on this subject.

Concerning Dr. Gall, the author of this system, who is said to be a physician of considerable practice, and generally esteemed in Vienna, we are informed, that from his earliest infancy, natural history was his favourite study; and his greatest delight consisted in collecting plants and animals of every kind, and classing them, not according to the method pointed out in books of science, but according to their obvious and sensible differences. As he grew up, he fixed upon medicine to be his profession, and was led by an impulse, which he considers as the result of his peculiar organization, to the habit of observation and comparison.

He was very early induced to remark the various shapes of the heads of his companions and fellow students, and to connect these peculiarities with their moral and intellectual character. Having remarked in some cases a striking conformity between the general form of the heads of those who also resembled each other in mind and temper, he inferred the general character from the general shape of the skull; but unfortunately he found, on further examination, as striking a disagreement as he before remarked a certain correspondence in these observations. This forced him to retract his former general inferences, and to be more precise in his remarks. He then began to direct his attention to the individual parts of the skull, and here he found less inconsistency in his particular deductions; but he was frequently forced to shift his ground in assigning the local organ he assumed. At the same time he called to his aid the observations of comparative anatomy and professional experience; and after many years of long and constant observation, he thinks himself justified in giving the result to the public, as facts proved by experiment, not as principles or rules susceptible of demonstration.

As soon as the first vague notions were formed by him, he very laboriously employed himself in collecting skulls of every description, which is much more easy in Germany than in England. He caused models to be taken in gypsum of living characters of eminence. He made great collections also of skulls of animals, and founded a cabinet of great extent and worth. As his ideas became more exact, he gradually made them known, and delivered lectures on the subject. At length his fame reached the court, and the Austrian government, under that fatal administration of bigotted and weak priests, which has at length brought down destruction on it, and threatens to involve the ruin of all civilized Europe, thought it right to interfere. Gall was interdicted lecturing, because his doctrine was said to lead to materialism and atheism. However, he had already a numerous party of adherents who had interest at court; some foreign ambassadors, it is said, interested themselves in his favour, and he was allowed to read before foreigners only;

only; that is, Austrian subjects were forbidden to attend his lectures.

At length, various unauthorized publications having been spread about the northern states of protestant Germany, and the public curiosity being excited, Gall resolved to deliver his lectures at the principal universities and large cities in the north of Germany. In his tour he delivered lectures at Dresden, Berlin, Halle, Jena, Weimar, Göttingen, Hamburg, &c. He was every where received with the distinction men of letters enjoy in Germany, and was invited to table at the little courts where he remained; a sort of criterion in that country, determining the rank and respectability of an individual. Thus he fulfilled the double purpose of enlarging the field of his own observation, and of conferring with professional men concerning his doctrines. That these latter gentlemen were in general not forward to oppose or confirm his theory in his presence, may be readily conceived. The contest generally began when the professor was departed. Every where a contest arose; but, I believe, says one of his auditors, in most places the majority were against our lecturer.

In presenting to the public a view of this system, we labour under the disadvantage of having no delineation of the subject from the author's own hand. Gall has declared his resolution not to write till he shall have completed a series of expensive and laborious engravings which are now preparing, when he purposes to give to the world a voluminous, splendid, and, as he thinks, decisive work. We must be contented, in the mean time, with the accounts published by some of his auditors. The most authentic of these are the following: "Lettre de C. Villers a G. Cuvier, sur une Nouvelle Theorie du Cerveau," Metz, 1802, of which the reader will find a very good analysis in the Edinburgh Review, No. III. art. 15. "Representation of Gall's Theory of the Brain and Cranium, by C. H. Bischoff, professor of Anatomy at Berlin; with Remarks by Dr. C. W. Hufeland, director of the Medico-Chirurgical College," Berlin, 1805, 8vo. in German. It is chiefly from the latter work that an English account of the subject, entitled, "Some Account of Dr. Gall's New Theory of Physiognomy, founded upon the Anatomy and Physiology of the Brain, and the form of the Skull," London, 8vo. 1807; is derived; the author of which states, likewise, that he has attended Gall's lectures, on whom he makes the following remark; "he seems to possess the faculty of observation in a much higher degree than that of reasoning. He has acuteness in observing the individual appearances of nature, but is not always happy in the formation of general notions; and I fear, too, that he is obnoxious to the poet's couplet;

"To observations which ourselves we make,
We grow more partial for the observer's sake."

He forms his premises readily, but he makes his deductions incorrectly." Two pamphlets in opposition to the new doctrine have been published by professor Walter of Berlin; of which, as well as of Bischoff's work, an analysis may be seen in the Edinburgh Medical and Surgical Journal for July 1806. These are the sources from which the following statement of Gall's doctrines is derived.

Gall thinks that he has made some important discoveries respecting the structure of the brain, which, as they are not at all interesting to the general reader, and do not affect the craniologic part of the system, we shall pass over very slightly. He was led to consider the brain as a membrane, and not as a pulpy substance, as it has hitherto been supposed, from observing that the intellectual faculties remained unimpaired in cases of hydro-cephalus internus, where a quantity of

water is collected in the ventricles, and the whole substance of the brain sometimes becomes distended to a membrane, scarcely a line in thickness. Other pathological facts, such as the paralysis of the extremities, in consequence of injuries done to the hemispheres of the brain, induced him to remark, that an uninterrupted connection must exist between these parts and the spinal marrow. With the view of tracing this connection, and at the same time to demonstrate the membranous structure of the brain, he engaged in a series of anatomical researches for many years, till at last he had the satisfaction of finding his conjectures verified by anatomical discoveries. He attributes his success to his manner of dissecting the brain from the lower parts, beginning with the cerebellum and spinal marrow, and going upwards, instead of following the usual custom of beginning the demonstration at the external superior parts, and slicing downwards; and, instead of a knife, which cuts and destroys the relative situation of the several parts, he employs the handle of a dissecting knife, or some blunt instrument, and unravels, as it were, the different circumvolutions of which the cerebrum and cerebellum are composed. The chief results of his anatomical investigations are, that the whole of the medullary substance of the cerebrum and cerebellum consists of nervous fibres, and the whole of the cortical substance of ganglions, by means of which the nervous fibres are nourished, strengthened, and more intimately connected. That the nerves which constitute the essential part of the cerebrum and cerebellum, as well as of the spinal marrow, are, like the blood-vessels, of two kinds; the excurrent or diverging, and the recurrent or converging, which all arise from the spinal marrow, or terminate in it, consequently, that the origin of the medullary substance of the cerebrum and cerebellum is derived from the spinal marrow. That the cortical substance is the superficial ganglion of the cerebrum and cerebellum; and that all the excurrent nerves terminate in the outer surface of the cortical substance, on which the pia mater rests, and all the recurrent nerves take their origin at this place.

Anatomists have usually thought that the medulla oblongata, the medulla spinalis, and pons varolii, are formed by elongations of the substance composing the cerebrum and cerebellum. Gall asserts directly the reverse; it is true, he goes the very opposite way to work, to demonstrate this intricate structure. Walter declares that there is no truth in what Gall pretends to have found out; the preparations displayed, and the structure described, are only the fictions of his fancy, and he protests that he saw nothing of what was said to be so clearly proved. Other persons, equally capable of judging, and perhaps more quick-sighted, not only saw what Gall proposed to shew, but do justice to the accuracy of his observations, by acknowledging their firm conviction of their truth. In Bischoff's work, the names of Loder and Reil, two very eminent men in the university of Halle, are brought forward to support the claims of Gall. Loder writes in terms of great praise, and communicates a case illustrating a part of Gall's new observations, at the same time acknowledging the want of a sufficient number of facts to confirm the theory of the different organs, and declaring himself a champion in the pursuit of truth. The controversy is now in the hands of those best qualified to judge its merits; by the observations of distinguished anatomists, the whole fabric of fame and future utility must stand or fall, and the reputation of Dr. Gall will be estimated accordingly.

The brain is in general universally understood to be the organ of thinking. But thinking is only a general term, including a vast variety of intellectual phenomena, and the

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brain is a very complicated organ. Shall we then, says Gall, rest contented with the general assertion, that the brain is the organ of mind? or shall we not rather, looking more narrowly into the structure of the brain, consider apart, in their relation to mind, those of its parts, which are anatomically shewn to be distinct, in the same manner as the brain, considered as one simple substance, has formerly been contemplated? We shall perhaps find that this more minute research is but a reasonable pursuit of the enquiry suggested by the first general observation. Gall professes to have made this inquiry, and to have found that we ought not to content ourselves with considering the brain as the organ of thought, but as a congeries of distinct organs, the existence of which alone renders that great variety and diversity of talents possible, which distinguish the different individuals of the same species hardly less strikingly from each other, than man himself is distinguished from every other species of beings we know.

Every one of those nervous streaks perceived in the great ganglion of the brain, makes a particular circumvolution of the hemispheres, and is to be considered as the organ of a particular function of the mind; that is, each streak may be looked upon as a part on which the mind operates according to a determined degree of force, and its structure is so organized as to receive the impressions communicated to it. The physiologist has observed in the animal creation, that the nerves of those animals which are distinguished for smelling, seeing, hearing, &c. are marked by being numerous and large, evincing a more elaborate development. And having been accustomed to see the olfactory, optic, and auditory nerves in animals proportionally large to the perfection of the senses they severally furnish the individual with, he will draw the general inference, that wherever any organ is met with in a higher state of development, there we may expect to find the power dependent on it, in corresponding energy. But the living brain can never be exposed to observation; and from the nature of its substance, loses much of its form and texture soon after the death of the subject.

The inference of the physiologist concerning the organs of the brain, would therefore avail him but little, unless some certain connexion were ascertained between the brain, and its permanent covering, the skull. This connexion is asserted in the following fundamental position; "that the internal lamina of the skull is, during the life of man, perpetually formed by the brain itself; and that, therefore, where the internal and external plates of the skull run parallel, we may infer the form of the brain from the outward shape of the skull."

On this fact, and on that before stated, that each of the circumvolutions of the cerebrum consists of an organ of some intellectual or sensible power, the greater size or development of which would of course give the skull its peculiar shape, rest the sciences of *craniology* and *cranioscopy*; the one of which asserts, that the shape of the skull indicates the law, by which, not the actual character, but the tendencies and dispositions towards character in men, are determined; and the other asserts, that that law can be discerned and ascertained by contemplating the shape of the skull. We are not to expect to perceive the already developed faculty of the mind, by mere observations made on the skull; it is the tendency only, or aptitude, or possibility of any particular intellectual quality in any individual, that can be discovered; and besides, all the predispositions cannot be selected by looking at the skull, because many of the supposed organs cannot influence the shape of the bones, in consequence of their remote situation.

All the organs, hence all the predispositions, both in men and animals, are said to be innate.

The functions of the brain are threefold: 1st, organic life; 2dly, sensitive life; and 3dly, intellectual life. A particular part of the brain is assigned to each of these functions; it is only in consequence of the size of the hemispheres (the part appropriated for the last of these functions) that man has the largest brain, and not because the size of the human brain is greater in proportion to the rest of the body, as hitherto generally supposed, nor on account of the comparative thickness of the nerves, as Soemmerring has observed. To prove that the organs of thought are placed in the hemispheres of the brain, these parts are said to be larger, and more completely developed, in different classes of animals, in proportion to their intellectual faculties; and they are most perfect in man.

The arguments brought forward by Gall in proof of the plurality of organs in the brain, are, 1st, the sense of fatigue, arising from the mind being long employed in one subject of contemplation; and the relief and delight we experience in variety; 2dly, the various degrees in which the different faculties are possessed by the same individuals; 3dly, the loss of certain faculties and powers of the mind from wounds, diseases, &c. affecting certain parts of the brain.

It may be useful to state more precisely the rules of observation, by which Gall challenges the public, and particularly professional men, to try his statements: having faith in the uniformity of nature, trusting that what he has long uniformly seen, others will also invariably remark. 1. By a close observation of living persons in a state of health, carefully feeling, and correctly noting, the eminences on the skull, each of which he considers as an organ, using that term in expressing the *continenus pro contento*; and considering that only as skull which immediately covers the brain.

This observation has taught Gall, that persons eminent for certain talents have certain eminences on the skull, and pointed out: while those who are altogether destitute of such talents, have a sinking or depression of the skull at this part. In order to make this experiment with success, Gall recommends it to be tried, not on common every day persons, but on those who are marked by strong peculiarities of mind and character: for perhaps every man has every kind of talent and tendency, though in so slight a degree as to be unproductive of any effects, from the stronger influence of other powers: hence the difficulty of determining the peculiarities of those who manifest mediocrity in all things, eminence in none. He also prefers subjects uneducated and uncultivated, as the natural tendencies of their character have been left more to themselves, while the polish of social life tends to rub off the prominent peculiarities of individual formation. In feeling for the organ, he recommends the use, not of the fingers, but of the middle of the palm of the hand: and declares that habit, as well as a certain natural delicacy of touch, is necessary to qualify a person to make these observations with certainty of success. 2. But some of the organs lie at the basis of the skull, and on its lower surface; these must be sought for after the death of the subject. 3. The observation of persons during a state of disease. This is particularly applicable to diseases of the intellect.

Insanity is, in the opinion of Dr. Gall, a disease of the brain; and as we observe a sort of partial insanity, so he is of opinion that parts of the brain may suffer a peculiar affection, while the other parts are left comparatively in a healthy state; but that the whole brain must be in a very dangerous

dangerous condition, is as obvious as the want of confidence in a person lunatic, or partially insane. Supposing there is in the brain generally a tendency to disease, Gall is of opinion that the prominent and eminently developed organ would be peculiarly liable to be affected. Hence Gall asserts an ability at all times to determine, upon an examination of the skull of a lunatic, in what way his insanity betrays itself, even if such lunatic should have avoided every actual expression of it. In mad persons, who have fancied themselves to be God, or Jesus Christ, or at least inspired prophets, as well as in those who suffer the agonies of religious despair, he has uniformly found the organ of theosophy. Thus it is that the fixed ideas of the insane are determined by their organ: and wherever any organ is found in a very high degree, there is always danger lest a disease of the brain should produce a corresponding madness: at the same time, it is possible, that where the profession and habits of men lead them to exercise a particular organ, and let it in a condition of great activity, though by nature there may be no peculiarly marked organ, yet that the disease may fix upon the organ so put into activity. And as the influence of life and habit upon the organ is as sure as that of the organ upon life, Gall advises that in many cases persons should try to resist the tendency of their minds, by following pursuits altogether the reverse: for instance, if he knew a young man of a melancholy turn of mind, full of nervous sensibility, conscientious and scrupulous, in whom also the organ of theosophy should be found in a high degree, instead of allowing him to follow what would probably be the bent of his inclination, the profession of divinity, he would urge him, on the contrary, to pursue an active life. This observation has led Gall to the application of cooling remedies on that part of the skull where the organ lies, from the diseased activity of which, the disorder proceeds: it being the same thing whether we affect the habits of thought and ideas, by diminishing the activity of the physical organ producing them, or whether we diminish the activity of the organ, by forcing the mind to other pursuits; that is, by rousing other powers, and setting other organs in motion.

4. By observing the influence which wounds and injuries of the brain have upon the intellectual powers and inclinations of men. 5. The comparison of the skulls of animals with their powers and qualities; and also of both these with the skulls and powers of men. 6. Impressions in gypsum of heads and skulls.

The organs of which Gall supposes that he has discovered the seat in the human cranium are twenty-six in number; and are divided by him into three classes.

I. Those by which man is immediately enabled to enter into connection with the external world.

1. The organ of sexual love, at the lower and back part of the head. 2. The organ of parental and filial love, and the animal *stirge*, at the upper portion of the occiput. 3. The organ of friendship or fidelity, between the ear and back of the head. 4. The organ of fighting, a little above and behind the ear. 5. The organ of slaughter lies before and above the preceding organ of fighting, occupying the squamous edge of the parietal bone. 6. That of address or cunning, is before and above the latter, and is seated in the sphenoid angle of the parietal bone. 7. That of cupidity is the organ of address, continued almost to the eyes. 8. Of good-nature in the centre of the upper part of the forehead. 9. Of mimicry or imitation, at the side of the organ of good nature. 10. Of vain-glory or vanity, at the back of the parietal bone, and at the side of the organ of loftiness. 11. Of constancy or firmness, in the middle of

the top of the skull, where the frontal angles of the parietal bones meet.

II. The second class of organs includes those by which we are enabled to acquire a more familiar acquaintance with objects, which are known to us by means of the external senses.

12. Organ of aptness to learn and retain things, lies immediately over the root of the nose, betwixt the two eyebrows, upon and above the glabella. 13. Of aptness to learn and retain places, fills that half of the eyebrow which is towards the nose. 14. Of aptness to recollect persons, (dubtful) at the upper part of the inner side of the orbit. 15. Of the sense of colour, lies in the superciliary arch, on the outside of the organ of taste. 16. Of aptness to learn and retain music, above and behind the exterior angle of the eye, where it adjoins the organ of cupidity. 17. Of aptness to learn and retain numbers, is placed on the outside of the organ of music, at the extreme end of the arch of the eyebrow, and at the exterior upper angle of the orbit of the eye. 18. Of aptness to learn and retain words, at the upper and back part of the orbit, producing in the living subject a prominent or goggle eye. 19. Of aptness to learn and retain languages, on the upper and anterior part of the orbit, so as to depress the eye, and make it appear rather hanging than prominent. 20. Of mechanic art, behind the organ of number, and below the point where the organs of music and cupidity meet. 21. Of prudence or circumspection, about the middle of the side of the head, or nearly in the centre of the parietal bone. 22. Of loftiness, at the back of the top of the head; *i. e.* at the posterior part of the sagittal suture.

III. The third and last class of organs, are those which constitute the peculiar prerogatives and glory of the human race, and which more eminently raise man above the brute creation. They all lie on the crown of the head, or on the forehead, that august feature which the poet considers as the glorious characteristic of humanity. The forehead rises in animals as they are advanced in the scale of intellect, but it is in man alone that the front assumes that graceful swell which is no less beautiful to the eye of taste, than significant to the physiognomist.

23. The organ of rhetorical acuteness lies on the middle of the forehead, above the organ of things, and beneath that of good nature. These three organs follow each other therefore in a straight line drawn from the glabella to the sagittal suture. 24. Of metaphysical subtlety; on each side of that of rhetorical acuteness; so that when strongly marked with the last organ, a prominent round swelling is formed. 25. Of wit: at the outside of the last mentioned organ. 26. Of theosophy, in the centre of the top of the forehead.

To enter into a detailed consideration of all these organs, would extend the present article beyond its just limits; we shall therefore transcribe the account of one or two of the organs in order to give the reader a general notion of the kind of proof and illustration on which the theory of cranioscopy is founded.

“The organ of sexual love (says Gall) is placed in the cerebellum. It comprises that part of the *os occipitis*, which lies below the *linea semicircularis inferior*, towards the great occipital hole, and in living subjects, therefore, is to be judged of only by the thickness and breadth of the throat and neck. It appears double on the skull; though the two organs and eminences of the cerebellum join, yet each produces a swelling apart on the skull, occasioned by the *crista occipitalis interna*, which lies between them.

“As the sexual passion arises, this part of the brain grows in disproportion to the other parts; and when, by

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castration, the purposes of nature in the formation of this organ are defeated, we find that it ceases to develop and perfect itself. It is observable in all who have suffered this operation when young, that the back part of the skull, as it were, ceases to grow; the neck is narrow, and the voice, whose seat is in the throat, loses its manly vigour.

"This remark is equally made in many species of animals. In the more simply framed animals, as in certain insects which generate in the usual way, the whole mass of brain consists of mere knots, which are, as it were, the commencement of the cerebellum: while in those other animals, which do not procreate in this way, these knots are wanting. The stallion and the bull have a more perfectly developed cerebellum, and consequently have a thicker neck and broader head behind, than the gelding and ox. This is known to the common people, who are concerned in the breed of horses, who give the preference to those stallions whose ears stand the widest apart. The male mule, which has no power of procreation, generally speaking, has a very narrow neck, and the ears stand close together. It is further observed, that the horns of the ox are much larger than those of the bull, for the reason before stated, that the process of ossification increases as the brain diminishes; from the same principle are the phenomena attending the growth of the horns in the stag. If at the time of rutting, the horns are cut off, the animal loses its power of procreation, in the effort of nature to reproduce this substance. The channel in which its strength should run is turned aside, and it does not recover its generative faculty till the horns are grown again.

"Throughout the whole class of quadrupeds, the neck of the male is thicker than that of the female. Gall attributes this to the longer duration of the sexual appetite in the male.

"There are many phenomena, in cases of disease, tending to the same conclusion. In the nymphomania, Gall has found the neck very hot, swollen, and painfully inflamed. He related the case of a woman of rank and character in Vienna, subject to the most violent attacks. She was frequently seized with convulsive affections in the neck; and in a sort of madness would violently knock the back of her head against her back and shoulders, till she obtained relief by means of a femoral discharge.

Wounds in the neck and back of the head will produce inflammation of the parts of generation, and even impotence.

"In nervous fevers, satyriasis is not merely a local disease, but a general evil of the whole nervous system; and to be removed only by some general remedy applied to the nerves. This seems to intimate the participation of the brain in generation.

"The cases of hydrocephalus are also in favour of the same doctrine. It is found that of all the general functions of the brain, that of generation is often the only one which remains undisturbed; and for a very natural cause, that the cerebellum suffers least of all parts of the brain.

"Cretins are notorious for their lasciviousness, while they are without the common intellectual powers, and their cerebellum is unusually large. The known effects of sleeping on the back, Gall also attributes to the pressure and warming of the cerebellum.

"Among other cases of insanity, he related one of a man, from whom the fixed idea could not be removed that he had six wives. The cerebellum was found monstrously large after his death. Once, on entering an hospital, in which he never had been before, he heard a mad woman uttering the grossest obscenities; he desired the attendants to go and examine

her head, declaring that if they did not find the skull remarkably large behind, he would renounce all his opinions. He was not deceived.

"The bust of Raphael, which was made from an impression taken in gypsum, exhibits a sort of bag behind, announcing that tendency of his constitution, to which he unhappily fell an early victim."

On the organ of aptness to learn and retain places, we have the following remarks.

The function which this organ is destined to fill in the inferior animals, is, that it gives the power of seeking out distant places, and of finding them again, when long deserted and left at a great distance. Birds of passage, such as swallows, storks, &c. are all marked by this organ; and it is known of such birds that they have a perfect recollection of their ancient places of residence. Swallows will return, year after year, to the same nest. Pigeons, which are used as letter-carriers, have also this organ. The capacity which animals (dogs for instance) have of following their masters, as well as of returning to their home, has generally been attributed, and often truly, to the acuteness of their scent; but many facts are known, which do not admit of this explanation. Gall related an instance of a dog taken to England from Vienna, which soon escaped from its new owner, went alone to the port, contrived to get on board a ship, and accompanied a gentleman to Mentz, whom he there deserted, and then took his course alone to Vienna. Whence can this uniform and otherwise inexplicable instinct arise, in a certain species of animals? And why should not this instinct be attached to a peculiar structure of the nerves and brain?

"In men, this organ seems to operate variously; but in every case it is connected with a disposition to observe the relations of space, and produces a delight and a peculiar ability in those occupations which depend upon such relations. For instance, both marshal Laudon and general Mack are distinguished by this organ; and these generals are both said to possess, in an eminent degree, that important part of the duty of a commander in chief, which lies in a skilful disposition of troops in the field; what may be called the geometry of war.

"It generates the love of travelling. After Gall had formed his opinion concerning this organ, he was struck by meeting a woman of low rank in the streets of Vienna, on whose forehead the organ was so strikingly marked, that he took an impression of her head for his cabinet. On inquiring of her concerning her life, he found she was possessed by a very mania for wandering. At sixteen she ran away from Munich to Vienna, where she lived, not as a servant at one place, for she could not possibly stay long in any family, but went from inn to inn, where her restless love of change was best gratified. She, as well as all persons thus organized, had a surprising skill in finding her way in strange places. We all know how very different this ability is in different persons, and that it stands in no general relation to the intellects in general. The portraits and busts of most eminent travellers and navigators are marked by this organ. If I mistake not, the biographer of captain Cook mentions his countenance being distinguished by overhanging eyebrows."

Having thus given a general view of Gall's doctrine, we proceed to state the objections which may be made to it. These, indeed, occur to us in such number, and of such strong weight, that we cannot help feeling surprised that Gall should have made so many proselytes, as we understand him to have met with, and that his system should have attracted so much of the public attention.

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CRANIOLOGY.

The foundations on which the whole doctrine rests, seem to us to be completely false; and the structure which Gall has raised on them, is supported by nothing but fanciful analogies, and the most loose and inapplicable kind of reasoning.

The first principle of the system, that the different faculties of the mind have each their separate and independent organ, offers to our consideration a most questionable position. At least, Gall's arguments in favour of the separate localities of thought are not at all convincing. The sense of relief, from a change of subject, after long study, is urged as a proof, that the part employed is different. But does not this argument almost beg the question? At least, does it not make too great use of the sense of muscular fatigue, which can be applied, only by a very loose analogy, to the brain? It is evident, that the brain, if it have any laws similar to those of muscular motion, has a much greater number peculiar to itself; and by what observation has it been shewn, that the peculiar affection of the brain, which we call, only by analogy, the sense of fatigue, may not wholly give place to a different series of affections of the same part? Even if the question were to be decided by analogies, those which justify this opinion are more numerous, and certainly more close, than those which are taken from the contractions of the voluntary muscles, since they are drawn from parts more immediately contiguous with the brain. The same eye which has been gazing on one species of light, finds relief from a mere change of colours; and, throughout the system, when one stimulus, from too frequent repetition, has ceased to produce effect, an effect is produced by a new stimulus, even of less absolute power; though we cannot suppose that the former parts are unaffected, and that each stimulus has its peculiar seat of action. We may remark also, that the relief takes place only in a certain degree, and is not enough to justify the supposed analogy; for, if one faculty be greatly fatigued, all the other faculties are reduced to a state nearly similar. Yet we know that one arm may be bent, in one continued attitude, till it be almost palsied with fatigue, when the other extremities are still in all their vigour, or, at least, have their vigour but slightly impaired.

The second argument adduced, is the partial loss of power, from external injuries of the brain, and from madness, and other diseases. The fact is certainly one of the most curious in the whole physiology of mind. But, unfortunately for Dr. Gall, it is found more frequently in the same faculty than in different faculties; and the health and disease are, consequently, according to him, in the same part. Such are the cases of persons, who have lost the memory of one language, and retained that of another; of this partial forgetfulness, there are many varieties, in kind, and in degree. One interesting case is related by Mr. Villers, from his own knowledge. It is that of a young lady, of very good understanding, at Frankfort, who, after much opposition from her relations, had, at last, obtained their consent to her marriage with a person whom she passionately loved. After recovering from a long illness, which succeeded her first delivery, she completely lost the memory of all the time that had elapsed since her marriage, though remembering every other period with as much accuracy as before. From the sight of her child, presented to her, as her own, she turned with amazement and horror; and though she now, on the faith of the assurance of all her friends, consents to consider herself as a wife and a mother; she still looks on her husband and child, without being able to conceive, by what magic she has acquired the one, and given birth to the other. Unless, therefore, Dr. Gall call in the

aid of the infinite divisibility of matter, and allot a different seat to each idea, such cases, it is evident, are more in opposition to his system than in its favour; since they shew, that what is confessedly the same part, may have lost its power in one respect, yet retain it completely in every other.

A third argument is drawn from the various degrees, in which the different faculties are possessed by the same person in perfect health. But, unless the question be affirmed, we do not see how this is more in proof of one opinion, than of its opposite. A mathematician, for instance, may have no poetic taste. The perception of the relations of mathematical ideas forms one series of affections, the perception of the beauties of poetry includes another series; and the two series are different, whether they be affections of the same organ, or of different organs: nor is there more reason, *a priori*, in the one case than in the other, that because one series exists, the other should exist also. We know, that in parts, which are confessedly the same, and originally even capable alike of either series, as in the muscular motions necessary in two mechanical arts, there may be produced the utmost facility of one series, while in the other there is all the awkward slowness of the most unexercised organs.

If however there were no other arguments on this subject, the records of morbid anatomy alone would suffice to overturn the unstable structure of Gall's system. These will shew us that there is not a single part of the encephalon, which has not been impaired or destroyed, without any apparent change of the intellectual and moral faculties. In the great work of Haller there is a very full collection of cases of this kind (*Element. Physiol. tom. iv. p. 338.*); and there is a similar catalogue in the fourth volume of the *Manchester Transactions*, where Dr. Ferriar has selected many of Haller's cases, with considerable additions from other authors. Against Dr. Gall, however, in particular, it may be of consequence to state, that, among the cases to which we refer, are some, in which the whole cortical part was wasted or corrupted, while the senses remained entire. Nothing can be more evident than that, if many organs be scattered over the surface of the brain, the entire and exclusive loss of one faculty should be, in so many cases of local injury, not a rare, but a common occurrence; and that, with the loss of the whole cineritious part of the brain; the whole of those powers, which have their seat in that part, must necessarily perish.

If the organs of many of the faculties be, as Dr. Gall affirms, double, since a disease of one side of the head does not necessarily imply a disease of the other side, each organ, even in health, must have its separate affections, which may correspond, but which may also be dissimilar: and the two may thus be exercised, at the same moment, on different subjects, or from the same subjects give opposite results. Thus, says an ingenious critic, the mind should be capable of completely believing, and, at the same moment completely disbelieving the same proposition. One of the organs of imagination, in a virtuous patriot, may thus be mourning over the probable ruin of his country, while the other is feeding on the profits of an offered place: and, perhaps, in this way, are to be explained many of the instances of timid irresolution in ministers of state; since the system of Dr. Gall fairly gives them the double head of Janus, and allows one organ to be eager for war, while the other is equally eager for the continuance of peace. Nor is it merely to similar organs, that this remark is applicable. The faculties, having all organs that are completely distinct, cannot interrupt each other, but may all be exercised at the same moment: and sermons and systems, puns and poetry,

be thus one general and simultaneous product. It is certain, at least, that all the organic affections may co-exist; and if it be thought that the mental affection must, notwithstanding, be single, because the mind is not capable of influencing, or being influenced by more than one organ at a time, we must attend to the analogies of the organs of sense and muscular motion, which, unless we beg the question as to the separate intellectual organs, are the only analogies afforded us. In these however we find a multitude, if not of simultaneous, at least of rapidly succeeding affections of different parts, very unlike the unity of thought. We can walk, and listen to a conversation, and remark the objects around us, without being conscious of an interruption of the exercise of the different organs employed. But there is no one, who, without being sensible of a very difficult transition, can writeanzas to the eyebrows of his mistresses, while he is solving a question of geometry or metaphysics.

Even though we were to concede to Dr. Gall, the truth of his general and more important doctrine of the localities of thought and passion, we should certainly be little inclined to ascribe with him, the difference of power merely to the quantity of the parts of the brain, and should therefore have little trust in the appearance of the cranium, as indicative of character; nor indeed, though it were certain that the difference of each power arose from a difference of quantity, would our reliance be much increased. That the general strength of the vital, moral, and intellectual powers is great in each individual, in proportion to the quantity of the encephalon, in an assertion, to which the experience of every one must have furnished him with a reply. Every person must have known large crania connected with very great dulness of these powers, and others in which they have all been condensed into a very small compass.

Dr. Gall himself is said to protest strongly against the attempts which have been made, to reduce his science to a species of physiognomy; yet, unless he himself consider the physiognomical application of it as allowable, we do not see how he is justified in drawing any inference from the inspection of a skull; and, if he do consider it in this light, he is not justified by the principles of his own theory. For, as the faculties are not all to be found in different points of one circumference, but lie under each other, in what may be called concentric circles of the encephalon, the elevation or depression of the skull may be produced by the uncommon largeness or smallness of a deeply seated organ, the superficial one remaining the same; or the superficial one may be greatly increased or diminished, and the increase or diminution be compensated by the opposite state of some deeper organ. The appearance of the skull therefore, even where we have an opportunity of examining the inner plate, is not indicative of the nature of any one power, and can be depended on, only as marking the superficial shape of the brain, and its meninges.

For what reason, except for the sake of this cranioscopical physiognomy, Dr. Gall has chosen to ascribe a difference of power to a difference of quantity alone, it is not easy to discover. It is at least equally probable, that the peculiar affections of the brain depend, in a great measure, on the minute differences of composition and texture; since in this way only, unless we admit an original difference in the mind itself, which Dr. Gall never takes into account, can we explain the possibility of great powers in a small cranium—what is that sense of fatigue, on which he himself has laid so much stress? The organ of the faculty employed is assuredly not diminished, or not diminished in any measurable degree: yet its power is now completely different. This

state of the brain is a certain state of it; and we can conceive that of two brains, of dimensions exactly similar, one should be naturally in this state of dulness, as well as in any other state, in the same manner as we can conceive a portion of the brain to exist in one degree of quantity, as much as in another. The *quantity* is therefore not the measure of the *power*; since, confessedly, the quantity may be the same, while the power is different. The great changes produced in the liveliness or lethargy of the faculties, by wine or opium, and in general by every stimulant or sedative, are reducible only to that law of the sensorium, by which the power is as the state of the part in *quality*, not in *quantity*. If Dr. Gall's theory were just, all moral education would be useless; for he has not attempted to convince us by any observation or experiment, that we have it in our power to reduce or amplify the organs of the affections. As, where there has been no external nor internal injury, the organ of sight must always afford its peculiar sensations, when colours are presented to it, the organ of the inclination to theft must always be affected in its peculiar manner, on the sight of an agreeable object. It is vain for us to pretend motives of bodily fear or of infamy; for these act only on the organ of courage, or of pride, or of judgment, which may be of greater or less size, but do not, by any of their affections, diminish the size of the organ of theft; and hence, if with the organ of this inclination, that of voluntary motion be in good understanding, an incessant series of thefts must ensue. In like manner, if there be any young man, of dispositions as yet uncorrupted, in whose fate we take an interest, our anxiety for the preservation of his virtue is superfluous. Let all his companions be profane, and selfish, and dissolute; what have we to dread? They cannot diminish the size of his organs of benevolence, temperance, and religion; and, till that diminution be possible, there is no influence in reason, or in ridicule, and no contagion in example.

Such are the reasons which prevent us from acceding to the fundamental positions of Gall's theory; that the different mental faculties, the passions, &c. are seated in so many separate organs of the brain, and that the strength or vigour of these is in a direct ratio with the size of the organ. But if these difficulties were surmounted, if the author had succeeded in proving these points satisfactorily, objections no less weighty still remain to the other points of the system, which would, in our opinion, be sufficient to overturn it. On contemplating the surface of the hemispheres, in the situations pointed out by Gall, we meet with no prominences, where he describes the various organs to exist; but find the brain to present an uniform and general convexity. We ought, however, to find the organs most easily and clearly on the surface of the brain, even if they are not very apparent in the living head; where the covering of membrane, skull, and integuments, may obscure their situation. In the basis of the brain, where the surface is much more distinguished by convexities and inequalities; and in the interior of the organ, where there are several very decided and constant eminences, and much curious structure, where, of course, we should naturally expect to find the seat of several organs, none have been pointed out.

The *cranioscopical* part of Gall's doctrine, or the examination of the cranium, with a view to discover the character and prevailing propensities of individuals, rests on an assumption, which we pronounce to be not merely questionable, but most clearly false: *viz.* that protuberances of the brain influence the cranium, so as to be attended with corresponding convexities of its surface: that the inner plate of the skull bears a most accurate impression of the surface of
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the brain; that the various convolutions of this organ mark it with the most obvious sinuosities; and that the vessels of the dura mater imprint very deep channels on the bone; are facts which could not escape the most superficial observer. But it is equally clear that the external surface of the bone has none of these marks, that they affect, therefore, the *internal lamina only*, and that all the front, upper, and back parts and sides of the cranium present a nearly level surface. Hence, if there be a prominence of the brain or its meninges, in any situation, it excavates the skull and renders it thin, instead of elevating the surface into a tumour. Thus the glandulæ-pachioni of the dura mater render the substance of the cranium so thin, as to make it appear semi-transparent, when held against the light; and the writer of this article lately observed in the head of a man hanged for murder, a remarkable and unusual prominence of two or three convolutions, in the situation pointed out by Gall, as the organ of metaphysical subtlety and wit; instead, however, of causing a corresponding external protuberance, they had only reduced the frontal bone to a state of unusual thinness.

In many parts, the external surface of the cranium, so far from any possibility of being modified by the form of the brain, is most clearly influenced by other causes. The root of the nose and eye-brows will assume a shape of greater or less prominence, according to the size of the frontal sinuses, which are well known to vary greatly in different individuals: yet, over these very cavities, Gall places the organs of the memory of places and colours. His organ of aptness to learn things lies over the spine of the os frontis, and that of music on the external angular process of the same bone, neither of which parts can possibly denote any protuberance of the brain. The side of the cranium is flattened by the temporal muscle, which acts with at least as much power on the outer plate of the skull, as the brain can on the internal surface. Hence, the deviation of this part of the skull from the general globular form of other parts of the bony case. Yet, in this very situation, where the action of the muscle thus depresses the skull, we meet with a whole host of organs; *viz.* those of fighting, slaughter, cupidity or theft, address or cunning, music, mechanic art, and a considerable portion of that of prudence or circumspection. In carnivorous animals, where the size of the temporal muscle is immense, and the whole cranium seems, as it were, compressed between the two opposite muscles, we are gravely told that there is a remarkable prominence in the situation of the organ of slaughter.

The objection, which we have been just illustrating, applies with still greater force to several of the examples which are drawn from comparative anatomy. The two tables of the skull are separated by numerous air-cells throughout their whole extent in many birds, which Gall still does not hesitate to adduce, in proof of particular organs. In the elephant, which is also pressed into the service, the skull is in the same manner hollowed out into numerous and large cavities containing air. The brain of the crocodile does not nearly fill the cranium, and cannot therefore influence its form; so that this animal might have escaped the author's censure for the want of parental affection. We may, indeed, enter a general objection to the introduction of comparative anatomy, with any weight of evidence, in a question of this kind. If any fact be certain of the nervous system, it is, that the different parts of the encephalon and its great appendage are in the different classes of animals, of very different degrees of importance to the exercise of the powers of life. When, after the amputation of that part, in which, according to Dr. Gall, the whole powers of life are included,

birds can still perform many of the most important functions, insects continue to live and procreate, and cold blooded animals seem for a while to exercise almost every faculty, which they before were known to possess, we cannot allow, in circumstances so different, any great degree of force to observations which proceed on the faith of complete similarity.

As we have already accused Gall of describing prominences, &c. where there really are none; so we may, on the other hand, complain that he has neglected a point of consideration, in which numerous striking differences are observable in the cranium. We allude to the national differences in the form of the head, which mult, according to his theory, be attended with corresponding variations of the mental faculties, and ought, therefore, to afford the most important results. (For an account of these, see CRANIUM.)

In the preceding examination of the system of Gall, we have attended to those fundamental positions on which the whole doctrine rests, and the destruction of which must involve the annihilation of the entire system. This will relieve us from the necessity of a detailed consideration of the author's observations on the different organs, which are universally exposed to the most well-grounded censure; and which leave on the mind of the reader, the general impression, that their author is very ill-acquainted with the just principles of reasoning and induction. We should, indeed, be disposed to question many of his facts. Is it possible that he should have found one-half of a man's brain "entirely mouldy?" Some of his observations on the mechanical excitations of the organs, are too ludicrous for any serious consideration, and would certainly justify the ridicule which the whole system has not unfrequently excited. When a person is unable to recollect any thing, and rubs his forehead backwards and forwards, we are informed that he is stimulating his organs of memory. Proud men raise themselves frequently on their toes; they hold their heads backwards, that the organ of loftiness may itself become more elevated. The timid man scratches his head on the organ of courage behind his ear, as if he tried to stimulate his feeble organ to activity.

CRANIOSCOPY, the examination of the skull, from *κεφαλιος, the skull, and σκοπεω, I examine*. This is a newly invented term, denoting that science which professes to investigate the influence which the form of the brain exerts on that of the cranium; and to draw from such observations, inferences as to the general character of individuals, their moral and intellectual qualities, their passions, propensities, &c. See CRANIOLOGY.

CRANIUM, in *Osteology*, that division of the head which forms the bony cavity for containing the brain. The corresponding term in English is the *skull*; that, however, is not limited like the word *cranium*, to the bones which form the brain-case, but is applied to the whole head. It is derived from *κεραυος, a helmet*; as it covers and protects the brain, like a helmet does the head. *Calvaria*, in Latin, is used in the same sense with cranium; but is applied, perhaps, with more propriety to the superior arched portion of the cavity; to that part which, in English, is called the *skull-cap*. The following synonyma will also be found in different writers; *κορυχος, κυτος, σκαφιον: calva, cerebri galea, testa, or scutella capitis*.

The bones of the head are usually distributed into two divisions; those of the *cranium* forming an oval vaulted cavity, which holds the encephalon; and those of the *face*, containing the parts concerned in mastication and deglutition, with the organs of sight, smelling, and taste. The

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close connection of these parts, and the necessity of considering them both together in the view which we shall give of the characteristic differences of the heads of various nations, would render it extremely inconvenient to adopt such an artificial division in the present work. We shall, therefore, describe the bones of the face, as well as those of the head, in the present article; and shall consider also the structure of the teeth, that the reader may possess, in one view, a connected and systematic account of the osteology of the head.

The arrangement of the subject, which appears to us the most eligible, and which will, therefore, be adopted in the present article, is that of making, in the first instance, a few general observations on the formation of the bones, their peculiar mode of connection, &c.; then, of proceeding to describe the individual pieces; and, lastly, of reserving the consideration of the head, as a whole, to the end; where its form, together with the relations of the cranium and face, and the deviations from the general standard, which it exhibits in the different varieties of the human species, will be more easily explained and understood.

The external surface of the cranium is every where covered by a thin, firm, and closely adhering membrane, called the *pericranium*; which is just the same as the *periosteum* of other bones. The cavity is lined by another membrane, the *dura mater*, connected to its surface with equal closeness. This may be considered as the periosteum of the internal table; for it sends at all parts numerous vessels to the substance of the bone. Hence, it cannot be separated from the skull without considerable force; and the nature of the adhesion is demonstrated, after such separation, by the numerous bloody points on its surface, arising from the torn orifices of vessels, which went to the bone. This membrane performs so important a part in the nutrition of the skull, that its separation from the internal table, in consequence of suppuration, causes the death of the bone, although the *pericranium* should be still adherent.

The thickness of the cranium varies considerably in different parts of the cavity. It may be stated, as a general observation, that the upper vaulted portion, which forms the skull-cap, and is liable to accidental injury and violence, is the thickest; and the basis or lower portion of the cavity, which is not exposed to these dangers, is the thinnest. The frontal bone, just above its external angular process, and the posterior triangular portion of the occiput, particularly at the transverse ridge, are thicker than other parts of the skull. With the exception of the ethmoid bone and orbit, the lower portion of the occiput and the temporal region are the thinnest; but these parts are protected by the insertion of strong muscles. Several pits and furrows, which are formed on the inner surface of the cavity, render its density very unequal, even in different parts of the same bone: hence, if a skull-cap be held against the light, it is almost transparent in some places. The thickness of the bone varies in the same head from about the fifth of an inch to a mere line. Great variety is also observed in the density of the skull of different individuals; so that we cannot conclude, because a person has a large head, that the bulk of his brain is proportionate. It is generally observed, that a large brain is covered with a thinner skull than a smaller one. Where the skull is thickest, it is found to consist, as the other *flat* bones of the body do, of two plates of compact substance, called the *external* and *internal* or *vitreous* tables, and of a more loose intervening bony texture, termed the *diploë*. The distinction of these parts cannot be traced in many situations; nor does it exist in very young subjects.

The substance of the cranium does not vary much in

structure in the different parts of the same individual; if we except the petrous portion of the temporal bone, which is composed of the hardest and most compact osseous substance in the body. In different subjects, the cranium, as well as the rest of the skeleton, may vary in firmness, solidity, and smoothness.

The outer surface of the skull is tolerably smooth and uniform on its upper and back part and sides; and, with the exception of two or three very small foramina, is entire and imperforate. The basis, on the contrary, is very irregular, and presents numerous openings for transmitting blood-vessels and nerves.

The inner surface of the skull presents every where an exact impression of the brain; so that a cast of the cavity, taken in plaster of Paris, would represent most accurately the form of the encephalon. It is a curious fact, that the bones always adapt themselves to the form of the soft parts, instead of influencing the figure of these, as we should, *a priori*, have been disposed to expect: the circumstance is very strikingly exemplified in the cranium. The glandulæ pæchioni of the *dura mater* form numerous pits along the middle and upper part of the bony vault; the sides of the cranium are marked with deep ramified channels, in which the blood-vessels of the membrane are situated. The convolutions of the brain leave broad superficial impressions over the whole vitreous table; (the grooves are the *impressioes digitatae*, and their rising margins the *juga cerebraalia* of authors;) these are most distinct in the basis crani, and particularly on the orbital plates of the *os frontis*, and the surface of the temporal bone. They are, however, manifest over the whole upper part of the cavity; which shews sufficiently that it is not the mere weight of the parts that gives rise to them.

The individual bones of the head, with the exception of the lower jaw, *ossicula auditus*, and teeth, are connected to each other by an immoveable species of articulations peculiar to themselves, called *futures*; so that when all the soft parts have been removed by maceration, these bones are still held firmly together. This mode of union assumes different appearances under various circumstances. Most frequently the margins of the bones are furnished with numerous small processes or denticuli, which are received into corresponding cavities of the opposed edges: hence the line of junction presents a very irregular serrated edge. This is the true future (*futura vera*, *ferrata*, or *dentata*); and the other modes of union are called false or spurious futures. When the bones are joined in a straight line, as it should seem from mere contact with each other, it is called *harmonia* (*futura harmonica*). Lastly, there is the *futura squamosa*, when the edges of the bones, extenuated to a very thin margin, overlap each other like the scales of a fish. Yet neither the *harmonia* nor *squamosa* future are formed by the mere contact of the bony surfaces; for there are in both cases small prominences and depressions, which, being adapted to each other, render the union firmer than a mere apposition would make it.

The mode in which the teeth are implanted in their sockets is distinguished by the term *gomphosis*, from *γομφος*, a nail; and the union of the lower jaw with the azygous process of the sphenoid bone on the one part, and the middle palatine future on the other, is called *schyndylesis*.

Where the bones are thin at their line of junction, the futures connect them in a perpendicular line: they are joined obliquely where the bony substance is thicker; and each bone overlaps the neighbouring ones at some points, while at others it is overlapped by them; so that the whole compages gains additional strength and security, and it is im-

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possible that any bone should be driven in upon the brain without a fracture. In every instance, the sutures, which may be very serrated on the external surface of the skull, are much more simple on the internal table: where, indeed, they present the appearance of harmonia. This difference in the appearance of the external and internal surfaces shews the futility of the common mechanical explanation of the formation of sutures, by the fibres of the opposed margins shooting into each other.

The cranium of the fœtus does not possess sutures: its bones have very thin margins, and are separated by membranous intervals, so that they can overlap each other considerably, and thereby admit of that compression and alteration of form, which the head experiences in passing through the cavity of the pelvis. As the ossification of the body proceeds, the edges of the bones come in contact, and form the sutures. The bony margins leave larger intervals in two situations of the skull, than in other parts; and it is of course longer after birth that these openings, which are called *fontanells* (*bregmata*), are closed. The *anterior*, or largest, is formed between the parietal and frontal bones; the *posterior* between the former and the os occipitis. We cannot state with accuracy the precise period at which the sutures are formed in a young child. The three edges of the os parietis, which are joined by true sutures to the neighbouring bones, begin to close towards the end of the first year; and their edges are completely in contact, except at the anterior fontanell, towards the middle of the second year. These vacancies are, however, sometimes not closed till a much later period of life. Thus, Caspar Bauhin states the fontanell to have been still open in his own wife, at the age of 26 years. (*Theat. Anatom.* p. 280.) And other facts of the same nature are recorded.

When the sutures are fully formed, the whole skull may be regarded, to all intents and purposes, as formed of a single piece of bone. In the latter periods of life, the sutures often disappear by the coalition of the opposed bones; and they are lost first in the internal table.

Separate pieces of bone, of various form and size, are often found in the course of the sutures, connected to the margins of the contiguous parts by future. These are the *ossa triquetra*, or *uvormiana*; and are most frequently met with between the occipital and parietal bones, although occasionally in other situations. As the presence of these is very uncertain; as they cannot be considered to belong to the ordinary formation of the part; and as their position, number, form, and size, vary almost infinitely; they are not enumerated among the regular bones of the skull, but are considered as unusual separate parts of that bone, to which they would have belonged, if the structure had been of the most natural kind. It is curious to observe the exact and symmetrical arrangement which these bones sometimes exhibit. They may be found of precisely the same form, and occupying exactly the same situation on both sides of the cranium.

The separation of the bones of the cranium, by membranous intervals, in the fœtus, is of obvious utility in facilitating the passage of the head through the pelvis. It is not so easy to prove satisfactorily, that any advantages are derived afterwards from this peculiar mode of connection; or that the cranium is at all differently circumstanced, in consequence of the sutures, from what it would be, if it consisted of a single piece of bone. The old opinions, which state that there is a transpiration of steams from the brain; that there is a more free communication between the external and internal vessels here, than in other parts; or that the

futures open under circumstances of disease, so as to relieve the brain; are completely unfounded. Nor is there any better ground for supposing that they are formed in order to give a firmer attachment to the dura mater; or that they stop the course of fractures. A more rational explanation of the subject appears to be this: that the sutures connect together the individual bones with a firmness sufficient for the security of the brain; yet in such a manner, that the separate pieces admit, in the early periods of life, of being distended by the brain, and making room for its growth. It is said, that if the bones of the cranium were not separated by the sutures, but formed one piece, they must cease to grow soon after birth, unless the formation had been conducted on other principles; but that, on the present plan, the growth of a bone of the cranium proceeds like that of any other bone. The separate pieces being joined by sutures, or rather by lines of cartilage, are gently separated by the growth of the brain; and hence the cartilage would become broader, if its former part were not at the same time converted into bone: thus the bones of the cranium are enlarged like the cylindrical ones, by the separation of their epiphyses, or, what is the same thing, they grow by their edges. This view of the subject is confirmed by observing that the adhesion of the dura mater is strongest in the course of the sutures, and that the number of vessels entering the bone is greatest in that part.

The bones which compose the cranium are eight in number: the *os frontis*, *os occipitis*, two *ossa parietalia*, and *temporum*, *os sphenoides*, and *ethmoides*. The six former are distinguished as proper bones of the cranium; while the two latter are said to be common to that cavity and the face. This distinction, however, seems very ill grounded; for the frontal bone has at least as much concern with the face as either the sphenoid or ethmoid bones.

The frontal bone forms the anterior portion of the bony cavity; the sides and upper part of the arch are formed by the parietal bones; the back of the skull, and part of the basis, by the occipital bone; the lower part of the sides, and middle of the basis, by the temporal bones; the sphenoid and ethmoid bones lie towards the front of the basis.

Soemmerring enumerates only seven bones of the cranium; as he joins the occipital and sphenoid bones together, under the term of os spheno-occipitale. They are indeed consolidated into one piece about the sixteenth year.

The following sutures join the different bony pieces, which form the cranium: the *coronal* suture, connecting the frontal bone to the two ossa parietis, commences about an inch behind the external angle of the eye, and passes directly over the top of the head, to the same point on the opposite side. The *sagittal* suture begins from the middle of this, and passes backwards in a straight line for about four inches, joining the two parietal bones; which are connected to the sides of the occiput by the *lambdoidal* suture. This has its origin from the termination of the sagittal, and consists of two diverging portions, compared to the λ of the Greek alphabet; whence the name of the future has been derived. These three are true sutures; where the union is of the dentated or serrated kind. Lastly, the squamous suture joins the upper portion of the temporal to the lower margin of the parietal bone.

The *additamentum suture squamosæ*, is a small portion of true serrated suture, extending from the squamous to the lambdoid; and uniting the posterior inferior angle of the parietal to the lambdoid portion of the temporal bone, where the junction of the occiput and parietal bone terminates; the former is connected to the posterior margin of the os tem-

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poris throughout the whole of its mastoid and petrous portions, by a continuation of the lambdoid suture, called *ad-ditamentum suturæ lambdoidalis*.

The *frontal bone* (*os frontis, os coronale*) is so called from its composing that part which we term the forehead. Its form has often been compared to that of a cockle-shell, to which indeed it bears an obscure resemblance. It is a *symmetrical bone*: i. e. if it were divided into two halves, each portion would contain exactly the same parts; and the same remark holds good of the occipital, sphenoidal, and ethmoidal bones.

It is connected with twelve contiguous bones; viz. 1, 2. The ossa parietalia: 3. Os sphenoides: 4. Os ethmoides: 5, 6. Maxillæ superiores: 7, 8. Ossa maxillæ: 9, 10. Ossa nasi: 11, 12. Ossa unguis.

It consists in the fœtus of two equal halves, which are joined, in the first years of life, by a suture continued from the front of the *sagittal*, but which usually coalesce at a subsequent period. It happens not unfrequently that this *frontal suture* continues through life, both in the male and female subject; and most commonly where the forehead is broad. A vestige of the former suture often remains at the root of the nose.

This bone contributes to the formation of three cavities of the head; viz. the cranium, orbit, and nose. Hence it may be naturally divided into the frontal part; the two orbital portions; and the nasal part.

The *frontal* portion includes by far the largest part of the bone. Its outer surface is convex, and the inner concave. Towards its upper, or rather posterior part, it forms a pretty regular semicircular margin, which being joined by the coronal suture to the ossa parietis, may be called the coronal edge of the bone. The frontal portion is every where smooth and uniform: except that, towards the lower and lateral part, some slight furrows are occasionally perceived from the course of blood-vessels, which communicate with the cranium. Towards the middle of the bone, and above the orbits, two superficial eminences may be observed, in the situation where the ossification commenced in the fœtus (*eminentiæ frontales, tubera frontalia*). The anterior extremities of the front lobes of the brain correspond to these protuberances.

The frontal portion is bounded below by two semicircular prominent ridges, which lie immediately under the eye-brows, and are thence called the superciliary ridges or arches. These parts, as indeed the whole frontal bone, have a most important influence on the character and expression of the countenance. They constitute about one-third of the margin of the orbits. The two extremities of each superciliary arch form the angular processes; to the internal, which lies just at the root of the nose, the nasal process of the superior maxilla is connected. The external (*processus orbitalis externus, or malaris*) forms a considerable prominence at the outer angle of the eye, terminated by a rough serrated surface, to which a corresponding part of the os maxillæ is firmly attached. Behind it the bone is flattened, and indeed rather excavated, as it contributes to the formation of the temporal fossa. This temporal surface is bounded by a slightly prominent line, forming a part of that ridge to which the temporal fascia is affixed.

A prominence begins at the root of the nose, just within the superciliary arch, and runs upwards and outwards with a curvature accommodated to that of the arch. These elevations, which vary considerably in different persons, but are always larger in the adult, than in younger subjects, sometimes run into one prominence, but may be completely

distinct. Their surface is usually irregular, and often displays numerous minute apertures. They denote the situation of the frontal sinuses. The space left between these is called by later writers the *glabella*.

The *orbital* portion of the bone, which is smooth and concave on its under surface, is continued backwards and inwards, nearly in a horizontal direction, from the superciliary arch, and forms nearly the whole roof of the orbit. Towards its inner and anterior part, or rather perhaps on the superciliary ridge, a small and scarcely perceptible groove, or sometimes a little bony eminence (*spina trochlearis*,) denotes the attachment of the cartilaginous pulley, in which the tendon of the trochlearis muscle runs. The orbital plate forms towards its outer part, and just within the external angular or malar process, a fossicula or superficial depression, in which the lacrymal gland is lodged.

The *nasal* portion of the bone commences just below the glabella, by forming a very rough denticulated surface, situated between the inner extremities of the superciliary arches, and sometimes denominated the nasal process. The ossa nasi are most firmly implanted on this irregular surface. Directly behind this process, a vacancy extends between the two orbital plates, which is occupied in the entire cranium by the cribriform lamella of the ethmoid bone, and is therefore distinguished by the name of the ethmoidal fissure. The bony plates, which form the side of this fissure, contain a series of small cells, which fit to similar cavities of the ethmoid bone. In front of these lies a pair of large irregular openings, which lead to the *frontal sinuses*. These cavities, (which seem to have been first noticed by Berenger of Carpi, in his "Commentaria super Anatomia Mundani," 1521,) are excavated in the lower and middle part of the frontal bone; and begin to be formed towards the end of the first year; but they are developed very slowly; as a slight vestige only is perceptible even at the twelfth year. The two sinuses are separated from each other by a bony partition, which separates into two plates where there is a frontal suture, and is often imperfect. They vary almost infinitely in their form, magnitude, extent, and connection with the ethmoidal sinuses; but in general extend over about two-thirds of the superciliary arch. The cavity communicates, by means of a funnel-shaped canal, formed of the os unguis, superior maxillary and ethmoid bones, with the upper and anterior part of the nose. These sinuses are covered with a delicate vascular membrane, the numerous blood-vessels of which secrete a watery fluid, that distils into the nasal cavity, moistens the Schneiderian membrane, and renders it more sensible to the odorous properties of bodies. That they are subservient to the sense of smelling, and not connected with the voice, is proved, according to Blumenbach, by various facts in pathology and comparative anatomy; for a further discussion of the question, see *NOSE*.

We proceed to describe the inner surface of the os frontis, according to the threefold division already employed.

The frontal portion is divided throughout into two equal halves, by the attachment of the falx cerebri. In the situation of this attachment, there is a broad superficial impression (*sulcus frontalis*) at the upper or posterior part of the bone; this becomes narrower and more perceptible below: where its edges at last coalesce into a sharp edged bony ridge (*spina frontalis*) that runs down to the nasal process. The rest of the surface presents several grooves and impressions; viz. there are some marks of the anterior branches of the spinous arteries on either side of the bone; the convolutions

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volutions of the brain mark the whole surface; and there are sometimes pits for the glandulæ paccioni.

The convolutions of the brain leave the most conspicuous impressions on the orbital plates: these processes support the anterior lobes; and as the bony substance rises into considerable pointed processes between the convolutions, while the substance of the bone is extremely thin, and almost transparent at other parts, its density is of course very various.

The following foramina are found in this bone, (*a*) *F. supra orbitale*, or *superciliare*, (which indeed is more generally a mere fissure;) transmits the frontal branch of the ophthalmic nerve, with a superficial artery from the orbit. There are sometimes two, or even more of these openings, (*b*) *F. orbitalia interna*, or *ethmoidea*, which are most commonly formed between the frontal and ethmoidal bones. The anterior, which is the largest, is occupied by the nasal branch of the ophthalmic nerve. The posterior, which is a smaller one, transmits the ethmoid artery: (*c*) *F. caecum*; between the crista galli, and the spine of the os frontis. It receives a small process of the falx: (*d*) an opening occasionally found in the lacrymal fissula, and transmitting an artery to the gland, from the dura mater.

The superciliary arch of the frontal bone has the m. frontalis inserted into it; the corrugator supercilii is also attached to the same part. The temporal muscle arises from a small portion of the side; and the cartilaginous pulley of the obliquus superior oculi is fixed towards the inner part of the ridge.

The *parietal bones* derive their name from the great share which they have in forming the sides or parietes of the cranium, of which they chiefly constitute the upper and lateral portions. As their edges form the fontanelles, they are very commonly called the *ossa bregmatis*: and are sometimes described under the term of *o. verticis*. They are very large bones, of an irregularly square figure, and very simple formation.

They are connected together by a straight line along the middle of the head (sagittal future;) to the os frontis by the coronal; to the occiput by the lambdoidal; to the ossa temporum by the squamous futures; and lastly, to the sphenoid ala by a squamous union. Hence they enter into the composition, by their four sides, of all the futures of the cranium, that are described under distinct appellations.

They are the only bones of the cranium formed from a single point of ossification, and resemble in the fœtus a thin convex shell. Their rounded corners constitute the edges of the fontanelles; and the ossicula wormiana are found most frequently along the margins of these bones; particularly the posterior one.

Each parietal bone has four sides, and four angles. The former are named according to the futures which they form, the sagittal, coronal, lambdoidal, and squamous edges; of which, the first is the longest, and the three others decrease in this respect in the order of their enumeration. The three first form nearly straight lines, while the fourth is concave, and terminates in a thin scaly edge, overlapped by the squamous margin of the temporal bone.

The frontal, or anterior superior angle; is formed by the junction of the sagittal and coronal edges; the occipital, or posterior superior, by that of the sagittal and lambdoidal; the mastoid, or posterior inferior, which is the most obtuse, by the lambdoidal and squamous; the sphenoid, or anterior inferior, which forms a sharp-pointed projection, by the squamous and coronal.

The external surface of these bones is convex and smooth, like the frontal portion of the os frontis; from which the

temporal ridge is continued in a gently curved line over the whole breadth of the parietal bone. Below this ridge, to which the temporal fascia is affixed, the bone forms a large share of that flattened surface, (*planum semicirculare*.) which affords origin to the fibres of the temporal muscle: and hence in strongly marked bones, the surface presents occasionally some converging impressions.

Their inner concave surface is marked by the convolutions of the brain; and has several considerable foræ on each side of the sagittal future; filled by the glandulæ paccioni. Ramified grooves, in which the arteria meningea media, and its branches are contained, cover the whole vitreous table. The origin of these impressions is at the sphenoid angle, where they commence in a deep bony channel, which sometimes forms a complete canal in the substance of the bone. A broad superficial sulcus, denoting the situation of the superior longitudinal sinus, and the attachment of the falx cerebri, is formed just under the sagittal future, and is therefore common to both bones. The mastoid angle is just touched by the lateral sinus.

The only openings are the two small *foramina parietalia*; one of which is placed on either side of the sagittal future towards its posterior part. A vein or artery passes through at this part to the dura mater. Frequently there is only one of these, and in many instances both are wanting.

The temporal is the only muscle whose fibres are fixed to this bone.

The *occipital bone*, (*os occipitis*) is a large, broad, and flat bone, convex on its external surface, like most of the other pieces of the cranium; and composing the posterior part of the cavity, together with a considerable share of the basis. It varies, more than any other part of the cavity, in size and form. Its articulation with the atlas connects the basis cranii to the upper extremity of the vertebral column. On its inner surface the back of the cerebrum, the cerebellum, and the medulla oblongata rest; and the medulla spinalis quits the skull through an immense opening in its centre. To the outer surface are affixed the muscles, which move the head on the spine.

This bone, in its general form, resembles two triangles joined together by their bases: the posterior or upper triangular portion is connected to the two ossa parietis by the lambdoidal future; the lower or anterior triangle is joined by the additamentum futura: lambdoidalis to the mastoid and petrous portions of the ossa temporum. The front extremity of this part is firmly connected to the body of the sphenoid bone. This union is effected by means of a layer of cartilage, till about the sixteenth year; after which time the bones grow together, and are consolidated by a bony union into one piece. Hence, Soemmering is justified in describing the two bones as one, under the name of *os sphenooecipitale*.

The os occipitis of the fœtus consists of four pieces, joined by cartilage; which at the end of the first year are very closely agglutinated; and soon after are consolidated by a bony union. These are; 1. The posterior, or *occipital* portion; 2. The two lateral, or *condyloid*; and, 3. The anterior, or *basilar* parts. The margins of these may be named, according to the bones with which they are connected; thus, the edge of the *occipital* portion will form the posterior or *lambdoid* margin; that of the *condyloid* parts, the middle or *mastoid*; and that of the *basilar*, the anterior or *petrous* edge of the bone.

The substance of the bone varies greatly at different parts; it is thick, strong, and compact, at the external transverse ridge and upwards; where its surface, covered only by the scalp, is exposed to the effects of accidental violence.

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lence. Its lower portion, protected by the muscles of the neck, is so thin as to be transparent in some parts. The basilar process is very thick, but consists chiefly of a cancellous structure.

That part of the *occipital portion*, which forms the back of the head, and is only covered by the scalp, has an uniform smooth surface. It is bounded below by an arched and prominent line, beyond which the bone turns forwards in the basis cranii. To this line, which varies in strength and projection in different persons, but is most distinctly marked in muscular subjects, the name of external transverse ridge is affixed. The muscles of the back begin to be attached at this part, and occupy a series of pits and eminences, which cover the surface as far as the occipital foramen. In the middle of the ridge, a more or less elevated prominence appears; and is called the occipital tubercle, (*protuberantia occipitis externa*;) from which a small longitudinal elevation extends to the foramen magnum (*spina occipitalis*). To this tubercle and spine the ligamentum nuchæ is attached.

Sometimes, but very rarely, a suture crosses the bone at the external transverse ridge; and in a very few instances the sagittal suture is continued along the middle of the occipital portion.

The inner surface of this division of the occiput presents a broad and deep groove, continued from that which runs under the sagittal suture, and lodging the termination of the superior longitudinal sinus. The back of the falx is fixed to the margins of this groove. The internal transverse ridge, which crosses the bone just opposite to the analogous external prominence, is hollowed into a similar channel; in which the former groove terminates; the right and left lateral sinuses occupy the last mentioned impressions, and are found at the point where the tentorium is fixed to the bone. A sharp-edged bony spine runs from the middle of the internal transverse ridge to the foramen magnum, and has the falx cerebelli attached to it (*spina, or cristula occipitalis interna*). A considerable groove is sometimes found on one side of this spine, and denotes the course and situation of an occipital sinus; but it is not found constantly.

The bony prominences, which we have now described, divide the surface of the bone into four large superficial cavities. The upper, smaller, and shallower fossæ, which are situated above the tentorium, hold the back lobes of the cerebrum. The lower, larger, and deeper hollows, contain the two lobes of the cerebellum, separated from each other by the lesser falx, and from the cerebrum by the tentorium.

The *condyloid* divisions of the occiput are chiefly distinguished by those oblong articular eminences called the condyles, which connect this bone to the atlas. These bodies are slightly convex on their articular surface, and placed just in front of the foramen magnum, with such an obliquity, that their anterior extremities approach to each other, and the posterior recede, or diverge. They are broadest in the middle, and have their external margin higher than the internal. An obscure line of division sometimes seems to divide them into two parts. Their outer edge has a rough groove for the capsular ligament; and the inner and anterior part presents a conspicuous impression from the attachment of the lateral ligaments of the vertebra dentata. A roughness near the styloid process of the temporal bone receives the attachment of the rectus lateralis.

The inner surface is excavated into a semilunar notch, which contributes to form the jugular foramen; and a considerable groove of the bone, leading from this notch, lodges the termination of the lateral sinus.

The *basilar portion* of the occiput consists of a rough bony triangle, sometimes called, from its figure, the cuneiform process. Its outer, or rather under surface, presents several asperities from the attachment of the pharynx, and of the *recti capitis interni* or *antici*. On its inner or upper surface it is slightly concave; and has the pons varolii lying on it. On the line of union between this part and the petrous portion of the temporal bone, the inferior petrosal sinus leaves an impression varying in its distinctness in different subjects.

The foramina of the occipital bone are; 1. *Foramen magnum occipitale*. This, which is placed in the centre of the bone, and near the middle of the basis cranii, is sufficiently distinguished by its superior magnitude. Its figure is that of an oval, with the long axis running from before backwards, and the short one placed transversely. All the four divisions of the fetal occiput contribute to this opening. It transmits the medulla spinalis, surrounded by a sheath of dura mater; the *nervi accessorii*, which are included in this sheath; and the two vertebral arteries. 2. *Foramen lacerum in basi cranii, or jugulare*, formed between the condyloid portion of the occiput, and the petrous part of the temporal bone. The internal jugular vein, and eighth pair of nerves, (consisting of its three portions; viz. the glossopharyngeal, nervus vagus, and accessorius,) pass through this opening. A thin plate of bone generally separates more or less completely the passage of the nerve from that of the vein. 3. *F. condyloideum anterius*, a round hole just in front of the condyle, giving passage to the 9th pair of nerves, or *n. lingualis medius*. 4. *F. condyloideum posterius*, which may be wanting on one or both sides of the bone. It is situated just behind the condyle, and sends a vein to the lateral sinus. 5. *F. mastoidea*, which are very irregular in size and situation; and sometimes entirely absent. They are formed in that part of the bone which adjoins the mastoid portion of the os temporis, or between the two bones, or in the temporal bone only. They are perforated by veins passing to the lateral sinus.

The occipital portion of the fronto-occipitalis, the trapezius, splenius capitis, and sterno cleidomastoideus are inserted in the external transverse ridge of the bone. The complexus fills a hollow just within the ridge. The two posterior recti, and the obliquus superior are fixed nearer to the occipital foramen. The rectus cap. lateralis; the recti anteriores, and the pharynx are also affixed to this bone.

The *sphenoid bone*, (*os sphenoidum*, from $\sigma\phi\eta\upsilon$, a wedge, and $\nu\delta\omicron\varsigma$, form; *os cuneiforme, basilare, polymorphon, multiforme, vespiforme*) is placed towards the middle and front part of the basis of the skull, and detaches several processes, which give it a very irregular figure, and connect it in an intricate manner to all the other bones of the cranium, and several of the face: at some parts the contiguous bones overlap the edge of the sphenoid; while in other situations that bone is overlapped by the neighbouring ones: hence it is considered to wedge, and hold firmly together, all the bones of the skull; from which circumstance its most common appellation is derived, and not from its bearing any resemblance in form to a wedge.

The Arabians called it *os colatorii*, or *os cribratum*, from the mistaken notion which prevailed for so many centuries, that the mucus of the nose flowed from the brain through its openings. The first physiologist who attempted to refute this long subsisting prejudice, who subverted the ancient error, and thereby threw a new light on a most important part of physiology and anatomy, particularly by disclosing the true structure of the sphenoid bone; was

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CONR. VICT. SCHNEIDER, professor at Wittenberg, in his classical, but really somewhat prolix work, "De Catarrhis."

The irregular figure of this bone renders it difficult and almost impossible to illustrate or explain it by any comparison: yet anatomists have likened it to a bird with the wings extended, and hence the names applied to some of its processes. In the fœtus at full time, it consists of three pieces; the *body* or central portion; and two large lateral productions, which include the *ala* and *pterygoid processes*.

On its anterior part, the sphenoid bone is joined to the orbital plates of the os frontis, to the ethmoid bone, vomer, and os malæ. The extremity of its great ala touches the anterior inferior angle of the parietal bone in the temporal fossa. The outer concave edge of the ala is extensively connected to the squamous and petrous parts of the temporal bone. At the back part it joins the basilar process of the occiput. Lastly, the pterygoid portions of the bone are connected with the superior maxillary and palatine bones.

The *body*, which appears like a continuation of the basilar process of the occiput, is the thickest part, and joins the ethmoid bone. It forms on its lower and anterior part a sharp lamina, which is connected above to the nasal lamella of the ethmoid bone, and passes below between the two layers of the vomer, under the name of the *azygous process*.

A variety is very frequently observed in the formation of the body of this bone; which is the more remarkable, inasmuch as deviations from the ordinary structure in the brain, or in the basis cranii, in other respects, are of very rare occurrence. In some skulls the basilar process of the occiput extends close to the posterior clinoid processes. In others, on the contrary, it terminates far short of this point; so that there is a peculiar oblique surface of the sphenoid bone, extending from the end of the basilar portion to the clinoid processes. Blumenbach proposes to distinguish this by the epithet of *clivus* (the declivity). This variation is so remarkable, that it changes completely the profile of the bone when viewed in a vertical section from behind forwards. Such a section represents a square in the former instance, and a pentagon in the latter. The upper side of this pentagonal figure is a line running from the posterior to the anterior clinoid processes: the second side forms the sharp edge on the front of the bone for the attachment of the septum nasi; the third is the part connected to the vomer; the fourth is the surface joined to the occiput; and the fifth is the above-mentioned clivus. When this formation exists, the fella turcica is deeper and narrower; and the space between the posterior clinoid processes and occiput is lengthened.

The upper surface of the bone is excavated for the reception of the pituitary gland; and the hollow thus formed is called the *fella turcica*. This cavity is bounded in front by a smooth prominence or tubercle, interposed between the two optic foramina, and supporting the conjoined portion of the optic nerves: behind by a thin perpendicular layer, which forms two rounded knobs, called the *posterior clinoid processes*; and it is open at the sides. The side of the body is excavated for the receptaculum, or cavernous sinus of the dura mater: and it bears a superficial impression made by the internal carotid artery just after it quits the canal of the temporal bone. The anterior clinoid process has sometimes been continued backwards to the body of the bone, so as to form a complete foramen, through which the carotid artery passes: this continuation has been distinguished by the name of the middle clinoid process.

The body of this bone, with the exception of its clinoid

processes, is formed into the two *sphenoidal sinuses*, which, in structure and office, resemble those of the os frontis. These are separated by a vertical partition; and open by round holes into the superior meatus of the nose. They are occasionally subdivided by bony laminae into smaller cells. Their lining resembles that of the frontal, ethmoidal, and maxillary sinuses; which has been described in the view of the os frontis: and, like all these cavities, they are not fully developed until many years after birth. Their openings appear smaller in the entire cranium than in the separate bone; as they are contracted in the former case by the *cornua sphenoidalia*. These are thin triangular bony plates connected to the back of the ethmoid bone; and placed at the sides of the azygous process, so as to diminish the apertures of the sphenoidal cells. Bertin calls them *cornets sphenoidaux*; Böhmer has delineated them in his *Institutiones Osteologicæ*, tab. 4. figs. 5 and 7. And Sue, in his splendid edition of Monro's *Osteology*, tab. 8. figs. 3 & 4.

Each lateral portion of the sphenoid bone consists of three parts: 1st. The lesser ala; 2dly. The greater ala; and, 3dly. The pterygoid portion.

The *superior* or *smaller ala* has a broad commencement from the front of the body of the bone: it runs outwards in an horizontal direction, and terminates in a sharp point; from which circumstance Monro has described it by the name of the transverse spinous process. Its anterior margin is joined by a suture to the ethmoidal and frontal bones, while the posterior edge is just opposite to the commencement of the fissura sylvii, by which the two lobes of the brain are divided. The origin of this ala forms a somewhat thick knob, called the anterior clinoid process.

The *great* or *middle ala* of the sphenoid bone is continued from the body in the lateral direction, and forms a considerable portion of the orbit, with part of the temporal fossa; in which latter situation it terminates by a thin squamous edge connected to the frontal, parietal, and temporal bones. It may be stated, in short, to fill up the vacancy left between these three portions of the cranium. The superior orbital fissure separates it from the lesser ala. Beyond the termination of the latter process it is joined to the os frontis by a broad surface; then towards its anterior and lower part to the os malæ; behind to the anterior inferior angle of the parietal bone, to the squamous portion of the os temporis by an extensive concave or semi-lunar margin, and, lastly, to the front edge of the petrous part of the temporal bone by its posterior margin. This last-mentioned portion, which contains the foramen ovale and spinosum, is called by Monro the spinous process; it cannot however be considered as forming a process distinct from the great ala, of which it is clearly a part. From its under surface a sharp pointed process is continued, which gives origin to the levator palati; this is the *styliform process*, and *apophysis spinosa* of different authors.

In its internal surface the great ala presents a large hollow, containing the convex anterior portion of the back lobe of the brain (the middle lobe of some writers). The bone is marked by the course of the spinous artery, and by the cerebral convolutions. The outer or temporal surface is the most extensive: it constitutes the lower portion of the temporal fossa, and is slightly concave. The anterior or orbital part is a smooth level surface, nearly of a rhomboid figure; separated from the former by a sharp ridge, and constituting chiefly the outer and back part of the orbit.

Between this portion of the bone, which is often called its orbital process, and the lesser ala, the *superior orbital fissure* (*foramen lacerum orbitale; fissura spheno-sphenoidalis*) is left.

The

The *inferior orbital, or sphenomaxillary fissure*, separates it from the os malæ.

Between the back of the great ala, and the adjoining petrous portion of the temporal bone, a rough and irregular groove is formed; which lodges the Eustachian tube.

The inferior ala, or *pterygoid portion* of the sphenoid bone, descends perpendicularly from the basis and greater ala, towards the superior maxillary and palatine bones. It consists of two thin plates: an *external*, which is broader and shorter, (*lamina muscularis*;) an *internal*, narrower, and longer one, (*lamina nasalis*;) forming the posterior opening of the nostrils, and terminating by a hook-like process (*hamulus*), round which the tendon of the *circumflexus palati* takes its course. The cavity left between these pterygoid plates (*fossa pterygoidea*) is occupied by the internal pterygoid muscle; and the fissure, which divides them from each other, is filled, in the entire cranium, by a process of the os palati, whence it has been denominated *fissura pterygo-palatina*.

Foramina of the Sphenoid Bone.

1. *Foramen opticum* in the base of the lesser ala, and just in front of the anterior clinoid process; for transmitting the optic nerve and ophthalmic artery. In very rare instances the artery has a distinct opening for its passage.

2. *Superior orbital fissure* (*f. lacrumum*) between the lesser and greater alæ: this is largest near the body of the bone, and grows gradually smaller. The third, fourth, ophthalmic branch of the fifth, and the sixth pairs of nerves pass through this opening; together with the ophthalmic vein, in its passage to the cavernous sinus.

3. *Foramen rotundum*, behind the former, and near the body of the bone; for the passage of the superior maxillary branch of the fifth pair of nerves.

4. *Foramen ovale*, near the back part of the great ala. It transmits the inferior maxillary branch of the fifth pair.

5. *Foramen spinosum*, between the last-mentioned opening and the pointed termination of the great ala, transmits the artery of the dura mater. This aperture is sometimes formed between the sphenoid and temporal bones.

6. *Canalis pterygoideus*, or *Vidianus*, formed at the root of the pterygoid processes, for the passage of a reflected branch of the superior maxillary nerve, of the same name. Its anterior opening is much larger than the posterior, and cannot be seen in the entire cranium: the latter cannot be discovered without difficulty; but it may be seen just at the root of the internal pterygoid plate, opening towards the broken anterior termination of the carotid canal.

There are other foramina found between the sphenoid and neighbouring bones, and which may therefore be called common holes.

1. A large irregular vacancy between the point of the petrous portion of the os temporis, and the side of the sphenoid bone. A mass of cartilage fills this in the recent subject. The carotid artery passes just over it within the cranium, and the Eustachian tube under it, without the cavity. The Vidian nerve enters the cranium by this aperture.

2. *Inferior orbital, or sphenomaxillary fissure* between the orbital portions of the sphenoid, superior maxillary, and malar bones. The infra-orbital nerve goes through this opening. 3. An opening between the body of the sphenoid, and the orbital process of the palate bone. See the description of the latter bone. The following muscles are attached to the sphenoid bone: *pterygoideus internus et externus*; the latter of which arises from the root of the external plate. The *circumflexus palati* arises from a hollow at the commencement of the internal plate. The temporal muscle and *levator palati* are also attached to the bone.

The *temporal bones* (*ossa temporum*, *ἡσποταφοί*;) constitute the inferior lateral portion of the cranium, and the outer middle part of the basis cranii. They contain the articular cavities in which the condyles of the lower jaw are received, and contribute to the formation of the zygoma. The organ of hearing is formed in their interior.

This bone consists of two pieces at the time of birth: the squamous portion, with the ring on which the *membrana tympani* is stretched; and the petrous portion. In a fœtus of five months, or more early periods, the auditory ring is not consolidated with the squamous portion; so that the bone consists then of three pieces. It is often divided into three parts, in describing it in the adult: these are the *squamous*, the *mastoid* (which is a part of the former division in the fœtus), and the *petrous*.

The temporal bone is joined to five others: 1. To the lower edge of the parietal by the squamous suture, and to the posterior inferior angle of the same bone by the *additamentum suture squamosæ*; 2. To the occipital bone, along the posterior margin of its mastoid and squamous portions, by the *additamentum suture lambdoidalis*; 3. By the front edge of the petrous and squamous portions to the sphenoid bone; 4. To the os malæ; and, 5. To the lower jaw, by means of a true joint.

The external surface will be described first, and then that which is placed towards the cavity of the cranium.

The squamous portion is a broad flat piece, terminating in a thin semicircular margin, which overlaps the corresponding edges of the parietal and sphenoid bones. The zygomatic process arises from its lower portion by a broad surface: this at first stands directly out from the bone; but becoming narrower, turns forwards, and is joined by a rough surface to the os malæ, to complete the bony arch, under which the tendon of the temporal muscle passes. The temporal fascia is affixed to the superior or sharp edge of the zygoma, and also to the prominent line, which, running backwards from the origin of this process, divides the squamous from the mastoid portion, and forms a continuation of the temporal ridge of the parietal bone. The fibres of the masseter muscle are affixed to the under edge of the bone. An oblong cavity is placed at the root of this process, (*cavitas articularis*, or *glenoidea*;) for the reception of the maxillary condyle. The position of this part is oblique; the outer end of the cavity being situated more forwards than the inner extremity: hence, if a line were drawn through the axis of the cavity on each side, the two lines would meet at an acute angle in the foramen magnum. In front of this glenoid cavity is placed an oblong convex surface, which is also included in the joint (*eminentia articularis, tuberculum articulare*). Behind is a thin plate of bone, forming the lower and anterior part of the meatus auditorius externus, and separating that passage from the articular cavity: this is sometimes called the *processus auditorius*. It is distinguished from the articular surface by the *fissura glaseri*, through which the *chorda tympani* proceeds. The large round opening of the meatus auditorius externus is found just behind the glenoid cavity: this passage will be more fully described presently, when we speak of the organ of hearing.

The posterior part of the bone, which is irregular on its surface, is distinguished by a large prominence, called the mastoid process, from a supposed resemblance to a nipple. This part is rounder or flatter, more pointed or obtuse, and more or less solid, in different subjects. It is excavated internally by numerous cells communicating with each other, and opening into the upper and back part of the tympanum. These cells are sometimes small and numerous; sometimes larger and fewer. The mastoid process does not begin to

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be formed until long after birth. The inner surface of this process exhibits a deep notch, which contains the origin of the posterior portion of the biventer maxillæ inferioris.

Behind this process there is occasionally observed a large opening for the passage of a vein to the lateral sinus (*foramen mastoideum, or occipitale venosum*).

From the broad plate of bone which forms the lower part of the meatus auditorius externus, the styloid process descends, arising as it were from a peculiar cavity, and surrounded at its root by the above-mentioned plate, as by an imperfect sheath; whence the term of *processus vaginalis* has arisen. The styloid process itself varies considerably in length; seldom, however, exceeding an inch. Its form is nearly cylindrical, its extremity is pointed, and it is generally straight; but varieties often occur in these points, as well as in the size of the process. It is usually connected by cartilage to the bone, even in the adult state; but is consolidated at a late period of life. Separate portions of bone are often connected to it by means of ligament; nay, the ligament which descends from it to the cornu minus of the os hyoides is sometimes converted almost entirely into bone, and appears as a prolongation of the styloid process.

Between the styloid and mastoid processes, but nearer to the former, is a round hole called the *foramen stylomastoideum*: this is the external opening of the aqueduct of Fallopius, through which the facial nerve passes.

A considerable excavation is formed in the bone near the root of the styloid process, for lodging a dilated portion of the internal jugular vein; and this contributes to the formation of the *foramen lacerum in basi cranii, or, f. jugulare*, through which that vein, together with the par vagum quits the cavity of the cranium. The passage of the nerve is separated from that of the vein by two projecting bony spines, which almost form a distinct opening.

The *foramen caroticum*, which is the entrance of the carotid canal, is a round hole placed towards the inner and anterior part of the last-mentioned opening. From this part the canal ascends first perpendicularly, for a very short space, and then is reflected at an obtuse angle forwards and inwards. Besides the internal carotid artery, the filaments which form the origin of the great sympathetic nerve pass through this canal.

We proceed to speak of the internal surface of the temporal bone. We observe here the extent to which this bone overlaps the parietal; which is often nearly half an inch in particular situations. The surface of the squamous portion is every where marked by the convolutions of the brain; and the bone is very thin between the eminences which rise in the intervals of the convolutions.

The mastoid portion is hollowed by a broad and deep channel containing the lateral sinus (*fossa sigmoidea*;) and the mastoid foramen, or foramina, open into this channel. The veins which occupy these holes are the emissaria of Santorini.

A sharp ridge, to which the tentorium cerebelli is affixed, and on which a groove is discerned for lodging the superior petrosal sinus, divides the petrous part of the bone into two uneven surfaces; of which one is superior and anterior, and the other inferior and posterior.

A very conspicuous convex eminence is placed on the former of these, and it denotes the situation of the superior semicircular canal. Towards the front and inner part of this prominence is placed a small hole, which enters the bone obliquely under a thin bony plate, and does not, therefore, come very readily into view, except in the separate bone. A branch of the Vidian nerve enters this opening to join the facial nerve: hence, it is very strange that

Blumenbach states the foramen in question to be the internal opening of the Fallopiian canal; which, on the contrary, is found in the meatus auditorius internus. (Beschreibung der Knochen, p. 129.) The carotid canal terminates towards the apex of the petrous portion by an irregular opening, which is completed in the recent subject by the attachment of the dura mater.

Just in front of this canal is a small opening, through which the Eustachian tube enters the tympanum. This is placed in the angle of junction between the squamous and petrous portions, at the front of the bone. The cartilaginous part of the tube, previous to its entering this opening, lies in a kind of broken and irregular groove, between the under surface of the petrous bone, and the posterior margin of the great sphenoid ala.

On the posterior surface of the petrous portion there is found, in front of the fossa sigmoidea, an oblique slit of various appearance in different subjects; through which the *aqueductus vestibuli* passes. Just over this is a slight indication of the upper end of the inferior semicircular canal. Still farther forwards is found a large opening leading into the bone, and appearing to terminate, on a superficial view, in a blind extremity. This, which is the *meatus auditorius internus*, receives the seventh pair of nerves, and will be more particularly described in the account of the bony organs of hearing. Just under this opening, and at the edge of the foramen lacerum, is a lunnet-shaped cavity (*apertura conoidea, Soemmerring*), at which the *aqueductus cochleæ* terminates.

Between the margin of the petrous portion, and the basilar process of the occiput, a groove is formed of various magnitudes in different subjects; in which the anterior petrosal sinus lies.

The following muscles are attached to the temporal bone. 1. Temporalis; 2. Masseter; 3. Sterno cleido-mastoideus; 4. Trachelomastoideus; 5. Splenius capitis; 6. Biventer maxillæ inferioris; 7. Stylohyoideus; 8. Styloglossus; 9. Stylopharyngeus; 10. Constrictor pharyngis superior; 11. Tensor tympani; 12. Laxator tympani; 13. Externus mallei; 14. Stapedeus; 15. Retrahentes auriculam.

The foramina of the bone are, 1st. One in the fissura Glaseri, for the passage of the chorda tympani; 2. A part of the *foramen lacerum in basi cranii*; 3. *F. caroticum*; 4. *F. stylomastoideum*; 5. *Meatus auditorius externus*; 6. *F. mastoideum*; 7. *Meatus auditorius internus*; 8. Entrance of the Vidian nerve; 9. Passage of the Eustachian tube; 10, 11. Terminations of the aqueducts of the labyrinth; 12. A common hole between the point of the petrous portion and the body of the sphenoid; described in the account of the latter bone.

Description of the bony Part of the Organ of Hearing.

The petrous portion of the temporal bone contains the organ of hearing, which we shall describe at present, since it is formed by the bone. As this seems to be the most natural arrangement, it has, consequently, been adopted by the most approved modern anatomists.

Few parts of the animal body afford a more attractive object of minute investigation than the organs of hearing; both on account of the admirable structure of the parts, and from the great importance of their functions. Hence, they have been so minutely examined by several great anatomists for the last two hundred years, that we possess more accurate and detailed descriptions of them, than of any other part in the body.

The great and modest Fallopius was the first who opened the

the right path in this investigation: he discovered most of the important points in the structure of the internal ear; and has described them in his invaluable "Observationes Anatomicae," Venet. 1561, 8vo. Of succeeding writers, who have illustrated this subject in particular works, we shall enumerate those only who may be considered as classical authors. Eustachius, who indulged, indeed, too much in a spirit of jealousy towards his contemporaries and rivals, but seems almost to have been born for the purposes of anatomical discoveries, will stand first on the list. His "Epistola de auditu Organis," is contained in the "Opuscula Anatomica," Venet. 1564, 4to.; and the same subject is illustrated in some of his plates, which did not appear till the year 1714.

Great progress was made in developing the structure of this organ by the cotemporary labours of several eminent anatomists about the end of the 16th and commencement of the 17th century. The first edition of Duverney's "Traité de l'Organe de l'Ouïe," appeared in 1683; and it is contained in the "Œuvres Anatomiques" of that author, which were not published till 1761. Mery opposed to this his "Description de l'Oreille," which came out with Lamy's "Explication Mécanique des Fonctions de l'Âme Sensitive."

Valsalva's "Tractatus de aure Humanâ," Bonon. 1704, 4to. is the produce of sixteen years' labour; during which time the author examined more than a thousand crania. Yet he met with a rival in Vieussens, whose "Traité Nouveau de la Structure de l'Oreille" appeared at Toulouse in 1714. He had, however, a more powerful defender in his illustrious friend Morgagni: who published Valsalva's works at Venice in 1740, accompanied with 18 epistles of his own, chiefly relating to the ear. A German anatomist, the indefatigable Cassebohm, who had prosecuted the investigation with that persevering industry which characterises the nation, had made greater progress in unfolding the structure of the ear, than either of the last-mentioned anatomists. His "Tractatus VI. de aure Humanâ," Halle, 1734 and 1735, present a model for such researches, which will hardly be exceeded. Lastly, a most perfect work on this subject has lately appeared in Germany; for which we are indebted to the celebrated Soemmerring. His "Abbildungen des Menschlichen Ohrorganes," Frankfurt on the Mayn, 1806, contain a most elegant series of engravings, representing the anatomy of the whole organ with that minuteness and fidelity, which the well-known abilities of the illustrious author would naturally lead us to expect.

Besides the above-mentioned works, in which the anatomy of the whole organ is considered, there are several excellent treatises on particular parts of the subject. Meckel's "Dissertatio de Labyrinthi Auris Contentis," Argent. 1777; Scarpa's "De fenestra rotunda," Mutinæ, 1772; and the "Disquisitiones Anatomicae de Auditu & Olfactu," Ticini, 1789, of the same author, are works of the highest merit: and the engravings in the last of these books are executed with unrivalled elegance. Much information may likewise be derived from the 4th book of Albinus's "Annotationes Academicæ;" from Monro's "Observations on the Nervous System;" and from Cotunnii's work "De Aquæductibus Auris Humanæ," Neapoli, 1760.

The organ of hearing, as formed in the bone, consists of three divisions. First, the external portion, or *meatus auditorius*; which terminates at the attachment of the membrana tympani; secondly, the middle portion, or *cavity of the tympanum*; and thirdly, the internal portion, or *laby-*

rinth. To these may be added the *officula auditus*, as a fourth division of the subject.

Of the Meatus Auditorius.

The external circumference of this canal is formed of the rough bony plate, passing obliquely from without inwards and forwards, which separates the meatus from the glenoid cavity of the temporal bone, and a part of which forms the processus vaginalis. The external opening of the passage is the broadest part of the canal: its greatest diameter is in a line passing from the upper and anterior, to the lower and posterior part. It penetrates the bone in an oblique direction, being inclined inwards and forwards. The upper surface of the meatus is considerably shorter than the lower, in consequence of the oblique position of the membrana tympani, which closes the canal internally, and forms the boundary between the external and middle divisions of the organ. This membrane has its superior margin directed considerably outwards, and its lower edge turned proportionally inwards.

In the foetal state the membrana tympani is stretched on a bony ring, *annulus auditorius*; which is somewhat oval in shape, more or less deficient at its upper part, where it joins the squamous portion, rough on its outer margin, and grooved internally, for the attachment of the membrane. Its posterior portion is thinner and sharper than the anterior part; which is grooved above for the reception of the long process of the malleus. This ring grows gradually broader, particularly at its lower part; and it is generally consolidated above to the temporal bone, before birth. The formation of the meatus proceeds, as the ossification of the skull advances; and it is completed about the age of puberty. This bony canal is therefore formed by a gradual increase in the breadth of the foetal annulus auditorius.

Cavity of the Tympanum.

This includes the space situated within the membrana tympani. Its surface is irregular, rough, and cellular in some parts. Its extent is much increased in the adult, by the formation of the mastoid cells. Besides the three *officula auditus*, which are contained in this cavity, we meet with the following parts.

The *fenestra ovalis*, is an oval opening, situated in a depression near the middle of the cavity of the tympanum; and filled by the base of the stapes. Its upper margin is more arched, and the lower more nearly straight. It opens into the vestibulum.

The *promontory* is a considerable rising, just below the fenestra ovalis. It indicates the commencement of the cochlea; and has the *fenestra rotunda*, which opens into the cochlea, placed just under it. This opening is occupied in the recent subject by a delicate membrane.

Above and behind the fenestra ovalis is placed a prominence, indicating the situation of the anterior extremities of the upper and outer semicircular canals. In front of the same fenestra is a considerable groove, which forms the opening of a canal running obliquely forwards, close to the Eustachian tube, and holding the tensor tympani muscle. The opening of the Eustachian tube itself is situated at the upper and anterior part of the tympanum. Just behind the fenestra ovalis is a very small hole, as if formed by the point of a needle, through which the thread-like tendon of the stapedeus comes out of the bony cavity in which the muscle itself lies. At some little distance towards the outside of the last-mentioned opening, and in the same horizontal plane with it, is another very small hole, leading to a canal, which terminates

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terminates in the aquæductus Fallopii, and transmits the chorda tympani. Over the fenestra ovalis, between the groove that holds the tensor tympani, and the opening for the tendon of the stapedeus, a portion of the aquæductus Fallopii appears. This canal conveys the facial nerve from the meatus auditorius internus, to the foramen stylomastoideum.

The mastoid cells open into the upper and posterior part of the tympanum. In the fœtus, where these cavities are not yet formed, there is a cell between the squamous and petrous portions of the bone, and therefore just over the tympanum: this forms in the adult the communication between the mastoid cells and tympanum.

The cavity of the tympanum contains the three *ossicula auditus*; viz. the *malleus*, *incus*, and *stapes*; which are distinguished by their diminutive size, and the elegance of their formation, and possess the important office of conveying the sound from the membrana tympani to the labyrinth. They are articulated to each other, connect the membrana tympani to the fenestra ovalis, and admit of being moved by three small muscles attached to them at different parts. They are the only bones in the body which acquire their complete size and form, and perfect ossification, before birth. Their structure is very constant on the whole, considered in their chief constituent parts; but variations in form are by no means unusual.

The *malleus* (which, together with the *incus*, was discovered about the end of the 15th century) has received its name from a supposed resemblance to a hammer. It resembles a short, knotty, and curved club; and is divided into the head, the handle, and two processes. The *handle* (*manubrium*) is closely attached, through its whole length, to the membrana tympani. The lower extremity of this part is placed about the middle of the membrane, which it draws inwards, so as to occasion a depression on the outer surface. At the upper end of the handle is placed the short process (*processus obtusus*) of the bone.

Rather higher than this process, there is a very slender sharp-pointed one, standing forwards from the neck of the bone: it is called the long process of the malleus (*processus spinosus*.) In young children it sometimes forms a very long curved and elastic bony spine. It rests in a groove of the annulus auditorius, and often becomes ankylosed to that part in the course of years.

Rau first discovered this part in the state in which it forms a bony spine, and hence arose the appellation of *processus Ravianus*. But the long process, as it is usually formed, was known long ago; (see S. Alberti "Hilior. plerarumque partium corp. hom." 1583. p. 84. & Fab. Hildanus "Die Fürtrefflichkeit der Anatomie," 1624. p. 190.) It is also delineated by Folius in his "Nov. Auris internæ delineat." Venet. 1645.

The *head* of the malleus stands off from the handle at an obtuse angle. It forms a rounded eminence connected to the handle by a contracted neck. It lies opposite to the upper margin of the annulus auditorius, and the articular surface, by which it is connected to the incus, is divided by a kind of groove into two parts.

The tensor tympani muscle is attached to the short process of this bone; and the externus mallei to the long process. The laxator tympani (of the muscular nature of which some entertain doubts) is inserted into the neck of the malleus.

The *incus* is shorter but thicker than the malleus; and its figure was compared not unaptly by Vesalius to that of a grinding tooth. It lies between the malleus and stapes, and is divided into a body, and two processes. The body of the bone forms an articular surface, with a middle eminence,

adapted to the head of the malleus. One of the processes (*the short leg* of the incus) is shorter and broader; and flattened in its form. This is placed in the same line with the processus spinosus of the malleus; but is turned backwards. The other (*the long leg*) is more slender, and projects into the middle of the tympanum, where it lies nearly parallel with the handle of the malleus; the chorda tympani passing between them.

Most anatomists describe a fourth bone, under the name of *os lenticulare*, or *orbiculare*, as being placed at the end of this long process, just where it is articulated to the malleus. On this subject we agree with Blumenbach ("Beschreibung der Knochen," p. 144.) in stating, that careful investigation in the most natural and ordinary structure of parts will shew this supposed fourth bone to be nothing else than an *epiphysis*, and not indeed a constant one, of the long *apophysis* of the incus. It is often wanting, even in *ossicula auditus*, which are in other respects most perfectly formed. This fact has been ascertained by Blumenbach in the crania of negroes and North American savages. It can only be separated in the adult by the application of some force; and the surface has afterwards a manifestly broken appearance, when examined with the microscope. And when, on the contrary, as sometimes happens, a really separate bit of bone is found between the incus and stapes, this can be no more considered as belonging to the ordinary natural structure, than those other supernumerary ossicula which are occasionally met with in man and animals. (See Teichmeyer "Vindicæ quorund. inventor. Anat." 1727. Cassebohm "Tractat. 4. p. 55.)

The third bone is the stirrup (*stapes*, *stapha*), which is the smallest in the skeleton, but very elegant in its formation, and possessing a peculiar and determinate figure, from which it derives its ordinary and well adapted name. It was first discovered by Ingrassias ("Comment. in lib. Galeni de ossibus," p. 57.) The situation of the stapes is horizontal; and it possesses a head, two crura, and a basis. The head is excavated into an articular surface for the long leg of the incus; and there is a slight prominence at its posterior part, denoting the attachment of the stapedeus muscle. The anterior crura of the stapes is straighter, and consequently shorter than the posterior, which is thicker and more curved. They are both grooved internally, for the attachment of a membrane which fills the opening between them. The basis is exactly adapted in form to the fenestra ovalis, which it fills; hence the superior margin is curved, and the inferior straighter.

The internal Division of the Ear, or the Labyrinth.

In a fœtus of six, seven, or eight months, the labyrinth consists of a peculiar firm, but thin and brittle bony substance, surrounded by an osseous matter, of a loose and spongy texture, which can be easily removed, so as to exhibit the labyrinth without much difficulty. The formation of this part is complete at the time of birth, like that of the *ossicula auditus*; but the ossification of the petrous portion in general is not so far advanced; for the superior femicircular canal is distinctly visible in the basis crani through its whole course; and there is a peculiar hollow within its curve, filled by a process of dura mater. The posterior canal comes also partially into view at this time; as the ossification of the skull advances, the petrous portion becomes more compact in its texture, and surrounds the canals more completely; it is consolidated at last into a particularly hard and dense bone, and the labyrinth at that time, instead of consisting of a substance distinct from the rest of the temporal bone, seems to have its cavities excavated in the hard

and almost impenetrable texture of the petrous portion. Hence the temporal bone of the fetus must be selected for the purpose of dissecting and examining the organ, and of making preparations of it.

The labyrinth consists of a *vestibulum*, or middle part; *cochlea*, or anterior; and *three semicircular canals*, or posterior portion.

The *vestibulum*, to which the fenestra ovalis leads, is a cavity of an elliptical form, in which two slight depressions are observable; an inferior and posterior one (*fovea hemisphærica*,) a superior and external one (*f. semielliptica*,) which terminates towards the orifice of the aquæductus vestibuli. These two foveæ are separated from each other by a sharp bony spine, with a denticulated extremity (the *pyramis* of Scarpa).

There are seven openings into the vestibulum: *viz.* five from the three semicircular canals (one end of the superior and posterior canal joining together, and terminating by a common orifice;) one from the superior scala of the cochlea; and one from the aquæductus vestibuli.

The *cochlea* is a convoluted bony tube, resembling externally a snail shell; from which circumstance its name is derived. It consists of two turns and a half, its axis is directed downwards and outwards. The base or broadest part is turned towards the termination of the meatus auditorius internus; and the first or largest turn forms at its commencement the promontory of the tympanum. The canal of the right cochlea turns towards the right; while that of the left follows just the opposite course. The bony canal, like the tube of the snail shell, turns round a central part called the *modiolus*, *nucleus*, or *columella*. This is hollow for the reception of a large branch of the auditory nerve; and in shape it is funnel-like; (*scyphus* of Vieussens.)

The canal of the cochlea is divided through its whole course into two passages or *scale*, a superior and an inferior one, by means of a most curious and artificially fabricated septum (*lamina spiralis*) which terminates at the extremity of the organ in a small hook (*hamulus*.)

Where this septum is attached to the modiolus it is bony; but it possesses a membranous structure towards the convolutions of the tube. The osseous portion of the lamina spiralis consists of two very thin plates, between which the ramifications of the auditory nerve are expanded in the form of a striated or net-like substance, to the fibres of which the bony plates are adapted. The branches of the nerve also leave impressions on the surface of the modiolus.

The lower scala of the cochlea terminates at the fenestra rotunda of the tympanum, and is therefore called *scala tympani*. The superior one opens into the vestibulum, and is distinguished by the name of *scala vestibuli*. Its aperture is just under the fenestra ovalis. The fenestra rotunda, which is closed by a thin membrane (*tympanum secundarium*,) is the termination of the scala tympani. The membrane is attached to a groove, which is visible on the inner margin of the opening, and is also connected to the membranous portion of the lamina spiralis.

The three semicircular canals are distinguished, according to their situation, by the epithets superior, inferior, and exterior. One extremity of each canal is rather larger than the other, and forms a dilatation called the ampulla. The smaller ends of the superior and inferior canals join to form a common opening, which is placed just opposite the fenestra ovalis.

The aqueducts of the ear are two very minute canals commencing in the labyrinth, and terminating by open orifices on the surface of the temporal bone. The *aquæductus cochleæ* begins in the scala vestibuli, and penetrating the bone, ter-

minates by an expanded orifice just under the meatus auditorius internus. The *aquæductus vestibuli* has its commencement just below the common opening of the superior and inferior semicircular canals, and terminates on the posterior part of the inner surface of the petrous portion, as mentioned in the description of the bone.

The meatus auditorius internus seems, on a superficial view, to terminate in a blind extremity. It is divided by a projecting bony ridge into two parts; an upper one, from which a canal commences, transmitting the facial nerve to the foramen stylomastoideum; the *aquæductus Fallopii*. The other portion of the meatus gives passage to the filaments of the auditory nerve. We may observe in it a considerable depression, which is the basis of the cochlea, and has therefore a convoluted spiral appearance; this is perforated through its whole extent with numerous foramina for the passage of those branches of the auditory nerve, which supply the cochlea; it is called by Scarpa *tractus spiralis foraminulentus*. By the side of this spiral impression are some smaller foveæ perforated in the same way for transmitting filaments of the auditory nerve to the ampullæ of the semicircular canals; these are the *maculæ cribrosæ* of Scarpa.

The *ethmoid bone*, so called from $\epsilon\theta\mu\omicron\varsigma$, a sieve, and $\epsilon\iota\delta\omicron\varsigma$, form, is known also by the name of *os cribroforme*, and is described by Galea under the term of $\sigma\pi\omicron\lambda\gamma\omicron\sigma\iota\delta\eta\varsigma$, or the *sponge-like bone*. It is the smallest of the eight bones of the cranium, and remarkably light on account of its numerous cells; but derives considerable importance from its delicate and intricate structure, and from the circumstance of its containing the chief organs of smelling. It has been excellently described by Schneider in his small, but invaluable work, "De ossæ Cribrosæ et sensu ac Organæ Odoratus." Witteb. 1655. 12mo. which forms an epocha in physiology, as refuting the twofold error which had previously been universally received; *viz.* that the odorous particles ascended through the ethmoid foramina into the brain, and that the mucus of the nose descended from the same part.

It appears, on a superficial view, to consist of an irregular assemblage of thin bony plates, intercepting various cavities; and not to admit of illustration by comparison with any known object.

It may be most conveniently divided into three parts. 1. The *cribriiform plate*: 2. The *nasal plate*, with the *crista galli*: 3. The intricate lateral portions.

The cribriiform plate, from the structure of which the whole bone has derived its name, fills up the ethmoidal fissure of the *os frontis*. This, with the *crista galli*, is the only part of the bone visible from the cavity of the cranium. Its position is horizontal, and lower than the orbital processes of the frontal bone, between which it is situated. It consists of a thin plate of bone, perforated by several small foramina, which lead to the nose, and are so numerous as to have suggested the comparison to a sieve. The filaments of the olfactory nerve penetrate this plate, which varies considerably in length, breadth, and general figure. The small ganglia of the olfactory nerves lie on this plate; one on either side of the *crista galli*.

The *crista galli*, which is the thickest and strongest part of the ethmoid bone, projects longitudinally from the middle of the superior surface of the cribriiform plate. It is situated towards the front of the bone; and is occasionally bent towards the right or left. Its superior edge is generally sharp, but sometimes obtuse. Towards the front it is joined by two small processes (*apophyses alares*) to the nasal portion of the *os frontis*, and thereby contributes to the formation of the foramen cæcum.

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The substance of the *crista galli* is generally occupied by medullary cavities; but it is occasionally formed into a hollow communicating with the frontal sinuses.

The *nasal plate* of the ethmoid bone is a thin, broad, generally flat, but sometimes curved lamina, descending perpendicularly from the middle line of the under surface of the cribriform plate into the cavity of the nose; where it forms the upper and anterior portion of the *septum narium*. It is connected in front to the nasal spine of the *os frontis*, and to the suture, which joins the *os nasi*. Its inferior margin, which is thicker than the rest, and has a somewhat spongy appearance, rests on the cartilaginous portion of the *septum narium*; its posterior edge is partly joined to the vomer, and partly to the body of the sphenoid bone.

The lateral portions of the ethmoid bone, which, on account of their complex structure, have been called the *labyrinth*, may be divided into three parts. The *concha narium*; the *cells*; and the *os planum*, or *papyraceum*.

The *concha narium superiores* (*ossa turbinata*, or *spongiosa super.*) are formed of a rough bony plate, having a spongy appearance, and placed parallel to the *septum* of the nose. Its superior margin is attached to the cribriform lamella, while the anterior extremity is connected to the nasal process of the upper jaw. There is a deep depression on this plate running from before backwards, and dividing it into two portions; each of which has a spongy convoluted appearance, and has a convex surface opposed to the *septum nasi*, while it is concave towards the orbit.

The lower of these two portions, which is much the largest, constitutes the *concha media* (*os turbinatum*, or *spongiosum medium*) of the nose. It hangs into the middle of the nasal cavity, and terminates by a convex unconnected margin, which runs longitudinally from before backwards. It has a more convoluted structure than the superior one. Its concave surface covers the *meatus narium medius*.

The upper portion (*concha super.* or *Morgagniana*; *os turbinatum*, or *spongiosum super.*) is much smaller than the preceding. It terminates in a projecting convex edge, turned towards the cavity of the nose. The space left between this and the preceding part is the *meatus narium superior*. Some unimportant varieties occasionally occur in these parts, as a division of the upper *concha* into two smaller ones by a groove, &c.

The ethmoid cells or sinuses fill up the space between the *conchæ* and the *os planum*. They are partially exposed along the upper and outer edge of the bone; but are covered at this part in the perfect cranium by the edge of the orbital process of the *os frontis*. The anterior cells are also covered extensively by the *os unguis* and the nasal process of the upper jaw, and the posterior ones by the orbital portion of the *os palati*. The number and arrangement of these bony cavities is very irregular. They open mostly into the superior meatus of the nose. The bony laminae, which divide them from each other, are the most delicate in the whole skeleton.

Just under the anterior cells there is a thin hook-like convoluted bony plate, connected to the cells or *concha media*, and extending backwards; it is called by Blumenbach *processus uncinatus*.

The cells of the ethmoid bone are covered towards the orbit by a thin plate of an oblong form, which, from its smoothness, has been termed *os planum*, and from its excessive thinness, *os papyraceum*. In conjunction with the *os unguis*, which is connected to the anterior margin of this plate, and covers the front cells of the ethmoid bone, it

constitutes the inner surface of the orbit, the partition which separates that cavity from the nose.

The nasal plate of the ethmoid bone, the *conchæ*, and the cells are all covered by the Schneiderian or pituitary membrane.

There is no muscle attached to this bone.

Foramina of the Ethmoid Bone.

1. Numerous small holes in the cribriform plate, transmitting the filaments of the olfactory nerve. These amount to two or three dozen. They are arranged, not indeed with perfect regularity, into two series; one of which, including the largest foramina, as Schneider rightly observed in his work "*De ossibus cribriformi*," runs by the side of the *crista galli*, and sends nerves to the *septum* of the nose; the other is placed towards the orbit, and dispatches the filaments, which are distributed on the surface of the two upper *conchæ*. These openings are the commencement of small and short canals, which run for various distances on the *septum* and *conchæ*, and terminate by open orifices through which the nervous ramifications come out to be distributed on the pituitary membrane of those parts. Some of these canals may be observed occasionally to reach as far as the lower edge of the middle *concha*.

Through a large opening in front, the nasal branch of the superior maxillary nerve, which enters the cranium through the anterior internal orbital hole, again quits that cavity.

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|---------------------------------------|---|---|
| 2. <i>Foramina orbitalia interna.</i> | } | See the description of the
<i>os frontis</i> . |
| 3. <i>Foramen cecum.</i> | | |

Connections of the Ethmoid Bone.

1. By its cribriform plate and *crista galli*, to the orbital and nasal portions of the *os frontis*, and sphenoid bone: 2—5. By the nasal lamella, to the *os nasi*, vomer, and sphenoid bone: 6, 7. To the superior maxillary bones in the orbit and nose: 8, 9. To the *os palati*: 10, 11. To the *os unguis*.

In the *fœtus* at nine months, the formation of this bone is very incomplete; as indeed is the whole organ of smelling. The *septum* and *crista galli* are quite cartilaginous; ossification has scarcely commenced in the lateral portion of the bone; but the cribriform plate, which supports the large olfactory nerve is larger than the other parts.

Besides the well-known osteological works of Albinus and others, and the classical book of Schneider, which we have already quoted; much information concerning the structure of this bone may be derived from Santorini's "*Observat. Anat.*" and from his posthumous plates, edited by Girardi: from the 4th fasciculus of Haller's "*Icones*;" from the 6th of Morgagni's "*Adversaria Anatomica*;" and from the 2d book of Scarpa's "*Annotationes Anatomice*," the plates of which are executed with unrivalled elegance.

Bones of the Face.

The bones which have been hitherto described form the cranium properly so called: those which follow, namely, the upper jaw with the bones connected to it, the lower jaw, and the teeth are included under the appellation of bones of the face. These are chiefly concerned in forming the instruments of mastication; but they contribute likewise to the cavities of the nose and orbits.

As these tend, when viewed altogether in relation to the bones of the cranium, to distinguish the head of man from that of other animals; so they are of great importance, when considered particularly, in influencing the natural or

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individual form of the countenance. This will be more particularly considered in the general remarks on the head at the end of this article.

These bones are generally distributed into two divisions : those which form the upper jaw, or the upper immoveable share of the face ; and the bone of the lower jaw.

The upper jaw consists of six bones on each side, of a thirteenth bone, which has no fellow, placed in the middle, and of sixteen teeth. The thirteen bones are, two *ossa nasi*, two *ossa unguis*, two *ossa malæ*, two *ossa maxillaria superiora*, two *ossa palati*, two *ossa turbinata inferiora*, and the *vomer*.

The *ossa nasi* are placed at the upper part of the nose ; the *ossa unguis* are at the internal angles of the orbits ; the *ossa malæ* form the prominence of the cheeks ; the *ossa maxillaria* form the sides of the nose, with the whole lower and forepart of the upper jaw, and the greatest share of the roof of the mouth ; the *ossa palati* are situated at the back part of the palate, nostrils, and orbit ; the *ossa spongiosa* are seen in the lower part of the *naris* ; and the *vomer* helps to separate these two cavities.

The bones of the face are joined to those of the cranium by the transverse suture which runs across the orbits and roots of the nose, and by *schindylesis* ; which is the peculiar mode of connection of the vomer. They are connected together by sutures, like those of the cranium ; but they have not such conspicuous indentations, and approach therefore more nearly to the mode of union called *harmonia*. The various sutures will be mentioned in describing the individual bones, which they connect. The lower jaw, which consists of a single bone, and has sixteen teeth implanted in it like the upper ; is not joined to the other bones of the face ; but is connected by a moveable articulation with the basis cranii. It is evident from the manner in which the upper jaw is joined to the cranium, that it can have no motion, except in common with the cranium.

The *superior maxillary bones*, (*maxille superiores*.) are by far the largest bones of the upper jaw, whence the name of *maxillaria* has been appropriated to them. They serve as a basis or foundation, on which all the other facial bones rest, excepting the lower jaw. They are largely concerned in forming the cavities of the nose and orbit ; they contribute also considerably to the cheeks and palate ; and they contain the upper series of teeth.

Each superior maxillary bone may be divided into a body, and four apophyses or processes ; viz. the *nasal*, *zygomatic*, *alveolar*, and *palatine*.

The body of the bone displays four surfaces or sides ; viz. the external or *malar* ; the superior or *orbital* ; the inferior or *palatine* ; the internal or *nasal*.

The malar surface is the most extensive of all. It commences below, by an arched or convex margin, just above which it has some slight eminences, (particularly towards the anterior part, where it acquires from this cause a fluted appearance,) from the situation of the fangs of the teeth. It terminates behind in a rough prominence, called the *tubercle*, which, besides the tracks and foramina of the vessels and nerves proceeding to the upper teeth, contains a muscular impression from the origin of the buccinator, and is marked also, together with the neighbouring malar process, by the attachment of the masseter. The malar surface contains, towards the front of the face, a superficial hollow, called the maxillary fossa, in which the infraorbital canal opens, about a quarter of an inch below the margin of the orbit. Just over this a small suture is observed, continued from the fissure of that canal. It terminates on its inner

edge in forming a semilunar notch, which, with the excavation of the opposite bone, forms the heart-shaped external aperture of the nostrils ; in the middle and lower part of which a rough bony prominence is placed, called the nasal spine. Above this prominence commences the nasal process, which, growing gradually narrower, ascends between the *os nasi* and *unguis*, along the side of the nose. It is convex on its outer surface, and slightly hollowed within. Its upper extremity terminates in a rough broken surface, attached to the internal angular process of the frontal bone. Its posterior and inner surface is marked by a deep groove ; in which a part of the lacrymal sac and nasal duct is lodged. The bony cavity for containing these parts is completed by the apposition of the *os unguis*.

The *orbital surface*, which has a somewhat triangular shape, is continued towards its lower and outer part into the zygomatic process : this is a broad surface having numerous depressions, and pointed eminences, by means of which it is firmly connected with the *os malæ*. A groove appears towards the back part of the orbital surface, and gradually deepens into a bony canal, called the *infraorbital*, hollowed out in the substance of the bone, but displaying a fissure in that part of its sides which is towards the orbit. The infraorbital branch of the superior maxillary nerve, and an artery of the same name from the internal maxillary, go through this canal, and come out on the face at the infraorbital foramen. In other parts, the orbital surface of this bone, which constitutes the whole inferior part of the cavity, is perfectly smooth. Its inner edge is joined to the *os unguis*, *os planum*, and *os palati* ; in front it has a rounded margin, forming a small part of the rim of the orbit ; and towards the back part it constitutes, with the sphenoid bone, the inferior orbital fissure.

The palatine surface has an external elliptical margin, which forms the alveolar process, containing sockets for eight teeth. This process is made up of an external and thinner, an internal and thicker plate of bone ; with transverse processes connecting these together, and thereby separating the different alveoli. The three front sockets, which hold the incisor and canine teeth, are nearly round in their form, and are simple cavities ; that of the canine tooth is longer and deeper than any other. The two next alveoli, which hold the bicuspides, are rather flattened laterally, and divided towards their upper part into two slight hollows. The sixth and seventh, containing the first and second grinders, are the largest sockets, and are subdivided into three cavities ; one of which is placed towards the palate, and the other two towards the cheek. The eighth is subject to great variety ; and may be either simple, double, or triple. The posterior alveoli, and their septa, are much more spongy in their texture than the anterior ones.

As the use of the alveolar process is merely that of receiving the fangs of the teeth, this part is not formed until after the teeth have appeared through the gum ; it grows round the root of the tooth, in proportion as the body rises in the mouth. When these organs are lost, the alveoli are soon after removed, so that the jaw of an old person resembles, when all its teeth are gone, that of a young child, which has not yet got any. When a single tooth is lost, and the contiguous ones remain, the alveolus is not always absorbed ; but the vacancy is filled up by bony matter, as if the two laminæ of the alveolar process had been pinched together, and united in a sharp line running between the two alveoli, which remain before and behind that of the lost tooth. The length of the face must of course be most materially affected by these changes in the jaw ; as we shall explain

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pain more fully in that part of this article which relates to the teeth.

The palatine portion of the upper jaw is concave, and very rough on its surface, where the arteries and nerves leave very manifest traces, being sometimes surrounded by complete bony rings.

Towards the front a small transverse fissure crosses the palate, and is lost between the incisor and canine teeth; hence a slight analogy arises to the intermaxillary bone of brutes. But there is this very obvious and important distinction to be observed; that no vestige of future can ever be traced in the human subject between the alveoli, much less on the upper and anterior surface of the jaw: so that the similarity to the structure of the quadruped is very remote. The fissure in question is more distinct in young than old subjects, and it is called by Blumenbach *futura incisiva*. Although this has been overlooked by several modern osteologists, it was observed and accurately described by the great anatomists of the sixteenth century, Vesalius, Fallopius, and Columbus. It is also mentioned by Riolan (*Anthropog.* p. 649.) Galen has expressly enumerated an intermaxillary bone among the component parts of the human face; and Vesalius very justly inferred from this, amongst many other equally striking proofs, that the anatomical descriptions of that author, which had been universally received with the most implicit deference till that time, had not been drawn from the examination of the human subject. This attempt to rescue mankind from error and prejudice drew upon him nothing but hatred and reproaches from his contemporaries, who were driven to the most absurd and causeless arguments in defence of their idol, Galen. One of them suggested that an intermaxillary bone might have belonged to the human face in former times. See Jac. Sylvii *de pulso calumniarum vesalii eujusdam in Galenum*. The inner margin of the palatine surface is joined by the middle or longitudinal palate future to the corresponding part of the opposite bone. The posterior edge is united by means of the transverse palate future to the os palati.

The *nasal surface* displays; 1. A small sinus which covers some of the anterior ethmoidal cells. 2. Towards the front, a margin joined to the os nasi by the lateral nasal future. 3. A groove varying in depth, which lodges the nasal duct; this is sometimes almost a complete canal. 4. A rough line for the attachment of the inferior concha or turbinated bone. 5. A large irregular aperture leading to the maxillary sinus. Sometimes the superior margin of this opening forms cells, which join those of the ethmoid bone. The nasal surface is then continued into the floor or bottom of the nose, which is rather contracted towards the front. In the future, which joins it to the opposite bone, the inferior margin of the vomer is implanted. A rough prominence is formed at this part, with a groove in the middle (*crista nasalis*) for receiving the vomer.

The *maxillary sinus* (*antrum maxillare*, or *Higbmorei*) of which the rudiments may be perceived some time before birth, is the largest cavity in any bone of the head, and possesses a very irregular figure. The various surfaces of the upper jaw, which we have just described, are merely thin plates of bone forming the walls of the sinus. It is only separated above therefore by the orbital surface from the orbit: it extends behind to the tubercle, and rests below on the alveoli of the back teeth, which are separated from it by a very thin bony plate; nay, in some instances, the fangs of the teeth are visible within the sinus. The sockets of the three grinders, and two bicuspides lie under the sinus. It opens into the middle meatus of the nose;

the aperture being much contracted by the ethmoid, palatine, and inferior turbinated bones.

The substance of the upper jaw-bone contains medullary cells in its thicker parts only; for instance, at the root of the nasal process, and just below the entrance of the nostrils, for the palatine arch is considerably attenuated towards its back part.

Canals and foramina of the superior Maxillary Bone.

1. *Canalis infraorbitalis*, and foramen infraorbitale.
2. *Foramen incisivum*, or *palatinum anterius*: a round opening in the middle palate future, just behind the incisor teeth: it communicates by a small aperture with both nostrils. A small twig of the superior maxillary nerve, and some insignificant blood-vessels pass through it. The nose and palate sometimes communicate through this opening, while the bones are still covered by the soft parts.

3. *Canalis lacrymalis*.

4. *Canalis pterygopalatinus exterior*, and *foramen palatinum posterius*; are formed between the maxillary and palate bones, and transmit the palatine artery and nerve.

5. *Fissura orbitalis inferior*; or spheno-maxillary fissure; a vacancy at the lower and outer part of the orbit between the sphenoid and upper jaw-bones. The infraorbital artery and nerve pass through this fissure.

The following muscles are attached to the superior maxillary bone: 1. Orbicularis palpebrarum, to its nasal process; 2. Obliquus inferior oculi to the front of the orbital surface; 3—5, a part of the masseter muscle, of the pterygoideus externus, and buccinator; 6. Levator labii superioris and alæ nasi; 7. Levator anguli oris. 8. Nasalis labii superioris; 9. Compressor narium; 10. Depressor alæ nasi.

Connections of the superior Maxillary Bone.

By the upper end of the nasal process to the os frontis, by means of the transverse future;—at the side of this process to the os unguis by the lacrymal future;—to the os nasi by the lateral nasal future;—to the cheek-bone by the external orbital future;—to the os planum by the inner side of the orbital surface, by means of the ethmoidal future;—by the back of its tuberosity to the os palati by the palato-maxillary future;—by the posterior edge of its palatine lamella, to the os palati, by the transverse palate future;—to the opposite bone by the longitudinal palate future;—to the vomer, along the superior surface of the last-mentioned future;—to the inferior concha or turbinated bone;—to the teeth by gomphosis.

Superior Maxillary Bone of the Fetus.

In the fetus at full time this bone possesses the same general structure as in the adult; but its parts have a different relation to each other. It consists however of a single piece only. The length of the bone is much less than in the adult, from the different structure of the alveolar portion; and from the same cause the palate, which is considerably arched in the adult, is nearly on a level with the alveolar surface at this time. Hence the remarkable shortness of the face. The orbital surface and nasal process are the most completely formed. There is, properly speaking, no alveolar process; but six large cells, containing the rudiments of the teeth, are hollowed out in the substance of the bone. This occasions the external surface to assume a tuberculated appearance; which is most conspicuous in young fetuses. The maxillary sinus is very small.

The *os male*, or cheek-bone, is generally called, in Latin, *os jugale*,

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jugale, or *zygomaticum*, from the share which it contributes to the formation of the zygoma. It is a thick and strong bone, slightly convex on its outer surface, but hollowed internally; connecting the superior maxillary bone to the *os temporis*, and forming more than one-third of the margin of the orbit.

It possesses a somewhat quadrangular figure with three thick and one thinner sides; but the proportion of these margins to each other varies considerably.

It may be divided into three processes; the *maxillary*, *orbital*, and *zygomatic*.

The maxillary process is the broadest, and includes the whole of the thin edge, beginning near the infraorbital foramen, it runs downwards and outwards. It forms a very rough irregular surface, by which it adheres most closely to the zygomatic process of the upper jaw.

The orbital portion of the bone forms a smooth rounded margin, beginning from the front of the orbital surface of the upper jaw, running first outwards, and then turning upwards to be attached to the external angular process of the frontal bone. It is continued for a short space within the orbit, where it joins the orbital surface of the great sphenoid ala. Some anatomists distinguish three orbital processes in the *os male*; a superior, which joins the *os frontis*; an inferior connected to the superior maxilla; and an internal continued inwards towards the cavity. It is the last-mentioned plate of bone that separates the orbit from the temporal fossa, and which belongs only to the quadrumanous mammalia besides man.

The zygomatic process passes backwards, to join that of the temporal bone, by means of an oblique suture; which connects the processes in such a manner, that the temporal bone forms most of the superior margin, and the *os male* the greatest part of the lower edge of the zygoma.

The upper and posterior side of the bone, which is continued from the superior orbital process to the zygoma, and which is turned towards the temporal fossa, forms a sharp ridge for the attachment of the temporal fascia. The lower side, which runs from the maxillary process along the zygoma gives origin to the masseter, and hence acquires a very rough surface.

The inner or posterior surface of the *os male*, which is concave, bounds the temporal fossa in front, and affords origin to the fibres of the temporal muscle.

A small round hole is observed about the middle of this bone, and sometimes there are even two or three such: a superficial branch of the superior maxillary nerve penetrates this foramen, and blood-vessels sometimes pass in this direction.

The zygomatic muscles, the masseter, and the temporal, are attached to the *os male*.

The substance of the bone is thick, hard, and compact; including but little medullary structure.

Connections of the Os Male.

By its superior and internal orbital processes to the frontal and sphenoid bones, by means of the transverse suture;—to the superior maxillary bone by the internal orbital suture, within the orbit, and by the external orbital suture towards the cheek;—by the zygomatic suture to the temporal bone.

State of the Bone in the Fetus.

As the cheek bones are the chief means of uniting the upper jaw firmly to the cranium, their formation is considerably advanced at the time of birth. Their magnitude is

considerable at this period, but their form changes afterwards. The orbital surface is large and conspicuous, while the facial and temporal portions are comparatively small.

The bones of the nose (*ossa nasi*, or *nasalia*) fill up the vacancy left between the nasal processes of the superior maxilla and *os frontis*. When viewed together, their external surface is regularly convex, and they are concave behind.

They are thick but narrow at the upper part, much broader and thinner below, where they terminate in a sharp attenuated margin. We may notice in each bone an outer and inner surface, and four margins.

The external surface is gently convex and smooth. It has usually one or more small foramina, for the admission of nutrient vessels. The inner surface is proportionally concave, rough on its surface, and marked by deep vestiges of blood-vessels.

The superior margin, which is narrow, but very thick, presents a very rough surface, by which it is closely attached to the nasal process of the frontal bone. Along the inner margin the two *ossa nasi* are united together by the middle nasal suture. The gradual change in the thickness of the bone, from its upper to the lower margin, may be observed along this part of the bone. The nasal lamella of the ethmoid bone is usually connected to the *ossa nasi*, at their line of junction to each other. The external margin rests on the nasal process of the superior maxilla. The lower edge, which is connected to the cartilaginous ala nasi, forms the upper part of the entrance of the nostrils.

The frontal muscle and compressor narium are attached to this bone.

The connections of the bone have been sufficiently detailed in the above description. On this subject we have only to remark further, the immense strength of their attachment. Their arched form, and the broad rough surface by which they are joined to the *os frontis*, renders their position so secure, that no external violence could possibly drive them in; although their lower thin edge might be easily broken. The utility of this strong union is immediately apparent, when we consider that the delicate ethmoid bone, which the smallest force would demolish, is placed directly behind the *ossa nasi*; and if this were injured, the fragments would probably be driven in on the brain.

The form of the *ossa nasi* in the fetus is very different from that of the same bones in the adult. They are nearly square; the superior margin being of equal breadth with the inferior. Their size is considerable in proportion to that of the other bones; and their formation is more advanced.

The *os unguis* or *lacrymale* is the smallest bone of the face, of considerable delicacy and elegance in its structure, and may be compared to the scale of a fish.

It is situated at the inner margin of the orbit; connected above to the *os frontis*; in front to the nasal process of the superior maxilla; below to the orbital portion of the same bone; and behind to the *os planum*. The suture which joins it to all these is called by *Monro* the *lacrymal*.

It is not so large, nor completely formed in the embryo, as the *os nasi*; but its size and development are considerable, when compared with the other bones of the face.

It contributes by nearly its whole surface to the formation of the orbit; but the lower end of its anterior margin forms a small curved hook-like process (*hamulus*), which assists in inclosing the lacrymal duct.

The external surface of the *os unguis* is, on the whole, smooth; but it is divided into two unequal portions, by a prominent and very sharp ridge (*crista longitudinalis*), which terminates below in forming the above-mentioned hamulus.

The posterior division of the bone is the largest, and may be called the *orbital* surface: the anterior or smaller portion, which forms a fossicula, contributing to the bony cavity for lodging the lacrymal bag, forms the *lacrymal* surface of the bone.

The inner surface of the os unguis is concave, and does not possess the smoothness of the external; it is marked by a groove in the situation of the crista; and it covers the anterior portion of the ethmoid cells.

The substance of the bone is of extreme tenuity, so that it is broken with the slightest force; and it is often perforated by numerous small holes in its lacrymal portion, by which the membrane gains a more firm attachment.

The palatine Bone (Os Palati).

This bone appears in the roof of the mouth like a small square portion placed behind the upper jaw; but it is considerably more extensive, being continued up the back part of the nostrils to the orbit: hence it assists in forming the two latter cavities, and in completing the bony arch of the palate. Its figure is so irregular, that it cannot be illustrated by any comparison; and it is so intricately connected to the surrounding bones, that to procure it separate and perfect in the adult state is a matter of much difficulty.

It may be divided into four portions: 1. The square palatine plate; 2. The pterygoid process; 3. The nasal lamella; and, 4. The orbital process.

The palatine plate or process forms a square and nearly level surface, occupying the vacancy left in the superior maxilla, and appearing like an uniform continuation of the palatal surface of that bone. Its superior surface forms the back part of the floor of the nose, and is smooth; the under surface is rather rough, but not to the degree which is observed in the palatine portion of the superior maxilla. The upper part of its internal edge rises in a spine, after the same manner as the palatine plate of the superior maxillary bone does, to receive the posterior part of the lower edge of the vomer. Its anterior edge is unequally rugged, for a firmer connection with the palatine portion of the maxillary bone. The internal edge is thicker than the rest, and of an uniform surface, for conjunction with its fellow of the opposite side. The posterior margin of the bone is slightly semicircular, according to the form of the corresponding portion of the velum pendulum palati: and when the two palate bones are joined, a middle projecting point is formed, from which the azygus uvulæ arises.

This palatine plate is well distinguished from the pterygoid process by a perpendicular fossa, which, applied to such another in the maxillary bone, forms a passage for the palatine branch of the fifth pair of nerves; the opening of the canal thus formed, on the palate, constitutes the posterior palatine foramen. There is another small hole behind this, through which a twig of the same nerve passes.

The *pterygoid process* (*processus pyramidalis*) is somewhat triangular, having a broad base, and ending smaller behind. The back part of this process has three fossæ formed in it; the two lateral receive the ends of the two pterygoid plates, and the middle one makes a part of the pterygoid fossa: hence the pterygo-palatine fissure, which divides the two pterygoid plates of the separate sphenoid bone, does not appear in the entire cranium, where it is filled by this pterygoid process of the os palati. The fore-side of the palatine pterygoid process is an irregular concave, where it receives the back of the great maxillary tubercle. Frequently several small holes may be observed in this triangular process, particularly one near the middle of its base, which communi-

cates a little above with the openings before-mentioned, and transmits an artery or nerve.

The *nasal lamella* of the os palati is a broad, but extremely thin and brittle, bony plate, rising upwards from the upper surface of the external edge of the palatine plate, and from the pterygoid process. It is so weak at this part, and yet so firmly attached to the maxillary bone, as to be very liable to break in attempts at separation.

From the parts where the plate rises, it runs up broad on the inside of the tuberosity of the maxillary bone, to form a considerable share of the sides of the maxillary sinus; and to close up the space between the sphenoid and the great protuberance of the upper jaw, where there would otherwise be a large slit, opening into the nostril. A cross ridge is observed on the middle internal side of this thin plate, for the attachment of the back part of the inferior turbinated bone. On the outside of this plate the perpendicular fossa made by the palatine nerve is observable.

At the upper part of the nasal plate the palate bone divides into two processes, called *orbital*; between which and the body of the sphenoid bone a hole is formed, transmitting a branch of the internal maxillary artery and superior maxillary nerve to the nostrils. Sometimes, however, this hole is proper to the palate bone, being entirely formed out of its substance.

The *anterior* of the two orbital processes is the largest, and has its fore part contiguous to the back part of the maxillary sinus; while its upper surface appears as a small triangular point in the bottom of the orbit, behind the back part of the os maxillare and planum, difficultly discernible in the entire cranium, on account of its diminutive size and remote situation. It has cells behind, resembling those of the ethmoid bone, to which it is contiguous; and it is placed on the aperture of the sinus sphenoidalis, so as to have only a round hole at its upper fore part.

The other division of the orbital portion is extended along the internal side of the upper back part of the maxillary tuberosity, to the base of the sphenoid bone, between the root of the processus azygos and pterygoid process.

The palatine portion of this bone, and its pterygoid process, are firm and strong, with some cancelli; but the nasal plate and orbital processes are very thin and brittle.

The circumflexus palati, azygus uvulæ, and a portion of both pterygoid muscles are connected to the os palati.

Foramina, &c. of the Palate Bone.

1. *Spheno-palatine*, or *pterygo-palatine notch*, or *opening*; formed between this and the sphenoid bone for the transmission of nerves and vessels to the nose.

2. *Pterygo-palatine canal* commences from the last-mentioned notch, and receives the nerve of the same name from the second branch of the fifth pair. This canal is formed almost entirely towards the lower part in the substance of the os palati; but the superior maxilla contributes to it generally at its origin. It divides below into three canals, the largest of which (*canalis pterygo-palatinus anterior*, or *major*) opens at the posterior lateral part of the palate, close to the alveolar process, by the large *posterior palatine foramina*, the formation of which is assisted by the superior maxilla. The *posterior pterygo-palatine canal* opens on the under surface of the *pterygoid process*; and the *exterior* ends between the latter process and the alveolus of the dens sapientiæ.

The chief palatine nerve, and the palatine branch of the internal maxillary artery, come through the large canal: smaller twigs of nerve pass through the other openings. There is sometimes only a single opening.

These canals and foramina may be seen in the treatise of Mekel "De Quinto pare Nervorum," and in the second book of Scarpa's "Annotationes Anatomicæ," tab. 2.

Connections of the Palate Bone.

The palate bones are joined to the maxillary, at the fore-edge of their square portions by the transverse palatine suture; by the thin nasal plate and orbital portion to the same bone, by means of the palato-maxillary suture; by the pterygoid process to the sphenoid bone by means of the sphenoid suture; by the transverse ridge of the nasal plate to the inferior turbinated bone. This union is frequently ankylosed in old skulls. By the orbital processes to the os planum and ethmoid cells, at the inner edge of its square portion, to the opposite bone, by the longitudinal palate suture, and at the upper surface of the same part to the vomer.

This bone consists, in the *tætus*, of a single piece; but its formation is incomplete. The orbital and pterygoid portions are the most perfect at that period.

The inferior turbinated Bone (Concha inferior; Os spongiosum inferius).

This bone resembles very closely, in structure and shape, that process of the ethmoid called the concha media. Realduus Columbus was the first who ascertained it to be a distinct and separate bone, "De Re Anatomicâ," p. 58. Several modern osteologists have however represented it as a process or appendix of other bones of the face; thus, Winslow describes it as a part of the os unguis; Santorini as a process of the os palati, "Obf. Anat." p. 38; and Hunauld as a portion of the ethmoid bone, "Mem. de l'Acad. des Sciences de Paris," 1730, p. 560, as Fallopius had long ago considered it. "Obf. Anat." p. 35.

It happens, however, very rarely, that the inferior concha is consolidated with either of these three bones. It might more justly be regarded as a part of the superior maxillary bone, with which it is sometimes ankylosed in the crania of persons not advanced in years, and well formed in other respects.

It is placed in the lower part and external side of the nose, and has that irregular, spongy, convoluted surface from which its names of *turbinated* or *spongy* bone are derived. The name of *concha* has been given to it from a comparison to the shell of the fresh-water muscle (*mya pictorum*), which will indeed bear a resemblance to it, if we suppose the shell placed longitudinally, with its long margin below, the hinge above, and the convex surface towards the septum nasi. The bone, however, varies both in size and form, and may sometimes be found in very elegant crania, forming a sharp edge without the usual shell-like convexity.

It is attached chiefly to the upper jaw and os palati: sometimes, however, it is connected to the processus uncinatus of the ethmoid bone, or by its upper and anterior extremity to the inner surface of the os unguis.

Ossification commences in these delicate bones about the middle of pregnancy, at which time the cartilaginous conchæ possess throughout a loose reticulated bony texture. In the newly born infant their ossification is very complete.

The external surface of the bone is concave, and its internal convex. Three margins may be observed in it; an anterior, a superior, and a posterior.

The anterior margin is the shortest, and terminates by a smooth edge; it is placed obliquely on the inside of the upper jaw, near the root of the nasal process, and covers by its attachment the termination of the nasal duct: its anterior end reaches almost to the outer margin of the orbit.

The upper margin forms a thin hook-like lamina which

closes a considerable portion of the lower part of the opening of the antrum, and rests behind on the os palati.

The lower margin is the longest and thickest of the three; very rough and spongy on its surface, and convoluted so as to form a convex edge. This covers the lower meatus of the nose.

The vomer was first recognized as a distinct bone by Columbus and Fallopius, "De Re Anatom." p. 48. "Obf. Anat." p. 33; who gave it the name of *vomer* from its form. Vesalius, on the contrary, described it as an appendage of the ethmoid bone, and he was followed in this mistake by Santorini, "Obf. Anat." p. 88. Anthony Petit in his edition of "Palsyn's Anatomy," Lieutaud and Portal, "Anat. historique et pratique de Lieutaud par Portal," vol. i. p. 66. Vidus Vidius represented it as a process of the sphenoid bone.

With the exception of its superior margin, it forms a thin and flat bony plate, and constitutes a considerable portion of the septum narium.

It is connected above to the sphenoid and ethmoid bones, below to the superior maxilla and os palati.

It has already acquired a considerable magnitude about the middle of pregnancy; but its form in the newly born child is very different from that of the adult. Its two laminae are widely distant from each other in the whole length of the upper margin, and they unite below, not to form a sharp edge, but a flat surface. It does not possess the rhomboidal form which it has in the adult, but is much narrower and longer. In progress of time the two layers approach nearer together, and sometimes are completely consolidated; or they leave at least only a small vacancy in the middle. It becomes at the same time broader, and acquires a rhomboidal form, so that it possesses four margins, *viz.* a superior, inferior, anterior, and posterior.

The superior margin is the thickest and strongest; it forms a deeply grooved surface, the sides of which form two flattened plates. The vacancy left between these receives the zygous process of the sphenoid bone, and the cornua sphenoidalia are connected to their margins.

The anterior margin is the longest, and generally has an irregular spongy edge. Its upper part supports the nasal lamella of the ethmoid bone; and on the front it is joined to the cartilaginous portion of the septum narium, which is often received into a kind of groove or fissure formed by a separation of the bony laminae.

The lower margin represents the cutting edge of the plough-share, and is received into the groove of the *crista nasalis* formed at the junction of the superior maxillary and palatine bones. Blumenbach states, that in cases of hydrocephalus internus, he has known this under edge of the bone to be driven down by the mechanical pressure of the accumulated fluid, so as to cause a fissure of the palate. "Beschreibung der Knochen," p. 221.

The posterior margin is sharp and even; it divides the back opening of the nares into two halves, running obliquely downwards and forwards from the sphenoid to the palate bone.

The lower jaw bone (*maxilla inferior; mandibula*) is by far the largest and strongest of the bones of the face. Its resemblance in form to a horse shoe is well known. It is connected only to the temporal bone by means of an articulation.

This bone, as Vesalius long ago observed, is shorter in man than in any other animal. Yet the elephant would, perhaps, form an exception to this rule, as the bone there seems to be really as short as in the human subject. It appears remarkably large, comparatively speaking, in animals

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of the monkey kind, even in such genera as are on the whole most *anthropomorphous*.

Its ossification commences at a very early period, and it has attained a considerable magnitude in fœtuses of the second and third month after conception; but its form at this period differs much from that which it possesses subsequently. In the fœtus, and in the newly born child, it consists of two distinct halves, which are connected by a cartilaginous symphysis at the chin. On account of the want of teeth it is very narrow, particularly at the sides. Its substance is hollowed out into large bony cavities, which hold the rudiments of the future teeth. The synchondrosis of the chin becomes firmly ossified in the first month after birth. In proportion as the temporary teeth make their appearance, the form of the jaw, consisting of a single piece of bone, becomes more and more developed. (The changes of its form, &c. will be more fully considered in that part of this article which relates to the teeth.) In most animals, on the contrary, the lower jaw consists throughout life of two separate pieces joined by a mere synchondrosis, which is destroyed by boiling or maceration.

The lower jaw-bone may be divided into the arch-like *body*, and into the two lateral productions (*rami*) which ascend from the extremities of the arch towards the basis cranii.

The *body* of the bone includes the *chin*, and two *lateral portions*, which run backwards to the *rami*. The former part constitutes nearly a square piece in the front of the jaw, in the cranium of a strong and well-formed man; and the lateral portions are continued backwards from this at an obtuse angle. This square form of the chin is particularly observable in the negro. But very frequently the bone forms a regular curve or arch at this part; and sometimes the chin has almost a pointed appearance. The part, where the synchondrosis existed in the fœtus, is still called the symphysis of the bone. The name of *basis* is applied to the inferior edge of the jaw-bone; extending from the chin in front to the *angle*, or part at which the *ramus* commences.

The superior margin of the *body* is formed into an alveolar process, resembling in its structure the same process of the upper jaw. The front surface of this process, which lodges the incisor and canine teeth, has generally a fluted appearance, as it is moulded to the fangs of those organs. The form of the alveolar margin does not exactly resemble that of the superior maxilla, as it is contracted in front: whereas the other forms a regular arch. The front teeth of the lower jaw are smaller than those of the upper, by which they are overlapped; and hence arises the difference in the outline of the two parts. The outer plate of the alveolar process is the thinnest, as in the upper jaw; but an exception to this observation occurs in the sockets of the second molaris, and dens sapientiæ; and particularly in the latter, which is almost covered externally by the coronoid process.

On the forepart of the chin there is a slight longitudinal ridge in the middle, on each side of which the bone is depressed to contain the depressor labii inferioris, and levator menti; and below a small rising may be observed, where the depressor originates. On the middle and back part of the chin, one or two more or less prominent pointed protuberances are observed (*spina mentalis interna*), to which the genio-glossi and genio-hyoidei are affixed. Below these are two rough sinuosities denoting the attachment of the biventres maxillæ inferioris.

At the lower and forepart of the outer surface of the *lateral portion*, a small eminence may be observed, where the depressor labiorum communis arises. Above this, at about the mid-distance between the alveolar process and basis is a

round hole, called the *foramen mentale*, which transmits an artery and nerve of the same name. The posterior alveoli are separated from the root of the coronoid process by a small groove (*sulcus obliquus*), close to which is a rough line for the attachment of the buccinator muscle. An oblique impression from the origin of the mylohyoideus may be noticed on the inner surface of the bone: it commences just within the socket of the dens sapientiæ, and runs obliquely downwards and forwards.

The end of the base of the jaw, where it turns upwards at an obtuse angle towards the cranium, is called the *angle* of the bone. And the *ramus* includes the whole broad and flat production which is continued towards the skull. The masseter muscle covers the whole external surface of this part: but the strongest impressions of its attachment are observed just on the angle of the bone. The corresponding portion of the internal surface is marked in the same way by the pterygoideus internus.

The *ramus* of the jaw terminates above in forming two processes. The anterior of these, which is flattened at the sides, sharp-edged, and pointed, is called the *coronoid*; it has the tendon of the temporal muscle inserted in it, and passes just within the zygoma.

The posterior process, or *condyle*, terminates in an oblong smooth head, which is articulated to the temporal bone; and supported on a smaller part or neck. The condyle, whose greatest length is transverse, and whose convexity is turned forwards, is covered with a cartilage, as the articulated parts of all other moved bones are. The posterior sharp edge of the coronoid process is continued into the front of the condyle, near its outer extremity; forming a semilunar vacancy between these two parts (*incisura sigmoidæ*.) The inner and forepart of the condyle is a little hollowed out and rough to receive the insertion of the pterygoideus externus. The direction of the condyle is not exactly transverse with respect to the cranium; but its axis passes obliquely from without, inwards and backwards; so that the outer extremity is placed rather further forwards, than the inner end; and hence these eminences are adapted to the articular cavities of the temporal bones.

A large irregular hole is found about the middle of the inner surface of the *ramus*; this leads into a *canal* hollowed out in the substance of the bone, and running under the sockets of the teeth, as far as the *foramen mentale*, where it opens externally. From this point, however, a smaller canal is continued under the alveoli of the front teeth. A large branch of the inferior maxillary nerve, accompanied by the inferior maxillary artery, and its corresponding vein, run in this canal. The chief portion of the nerve comes out again at the *foramen mentale*, together with a minute twig of the artery; and a small branch of each enters the canal under the incisor teeth. A groove is observed on the inner surface of the bone, commencing at the origin of the canal, and running forwards; sometimes there is a complete bony tube for some distance. It holds a branch of the inferior maxillary nerve.

The surface of the lower jaw is hard and firm, except at the spongy sockets; where, however, it is stronger than the upper jaw. Its internal substance is cellular, without any solid partition between the cancelli in its middle. At the base, especially of the chin, where this bone is most exposed to injuries, the solid sides of it are thick, compact, and hard.

The following muscles are attached to different parts of the lower jaw-bone; depressor labii inferioris; depressor anguli oris; levator menti; platysma myoides; masseter; temporalis; pterygoideus externus et internus; biventres maxillæ

maxillæ inferioris; mylohyoideus; geniohyoideus; genio-glossus; buccinator.

The joint of the lower jaw with its motions, will be considered under the article MASTICATION.

Of the Teeth.

Parts common to all the Teeth.

Each tooth consists of three parts; the *body* or *crown*, which appears through the gum in the cavity of the mouth; the *root* or *fang*, which is lodged in the alveolar process; and the *neck*, round which the gum adheres, dividing the two first mentioned parts from each other. Every tooth has an internal cavity, which extends nearly the whole length of its bony part. This opens or begins at the point of the fang by a very minute aperture: it grows larger in its passage, and terminates in the body of the tooth, where it is the largest of all. This latter part is exactly of the shape of the body of the tooth to which it belongs; and, indeed, it may be stated in general terms, that the whole cavity is nearly of the form of the tooth itself, larger in the body, from whence it gradually diminishes to the extremity of the fang. Where the tooth has only one root, the cavity is simple; in others, each fang has its own hollow, which opens into the common excavation in the body of the tooth. This cavity is not cellular, but smooth on its surface; and is filled with a soft membranous and pulpy substance, which is made red by injection, and probably receives branches of the nerve, as it is exquisitely sensible, when exposed by decay of the tooth. The blood-vessels, when injected, can be traced through the whole cavity; but it is difficult to pursue the nerves even to the point of the fang. The surface of the crown of the tooth is the only bone in the body not covered by periosteum. The fang is, however, invested by a membrane of this description, from the neck to its extremity. This, though very thin, is vascular, and appears to be common to the tooth which it encloses, and the socket, which it lines as an investing internal membrane. At the neck of the tooth, it is attached to the gum.

Connection of the Teeth.

The fangs of the teeth, implanted in the alveoli of the jaws, are compared to nails driven into wood; and hence the mode of union is called *gomphosis* (from γομφος, a nail.) By the adhesion of the above-mentioned periosteum, and of the gum, and the close connection of the alveolar process, the teeth are so firmly retained in their situation in the living subject, that they can only be separated by considerable force. When, however, the soft parts are destroyed by macerating the cranium, those teeth, which have only one fang, drop out; while such as possess two or three diverging roots, are retained in their situation.

The Gums.

The alveolar processes are covered by a red vascular substance; called the gums. This is perforated by as many openings as there are teeth; the necks of which are covered by the closely adhering sides of the apertures. The external and internal gums are united by transverse fleshy partitions, which are higher than the other parts of the gum, and thence form an arch between every two adjacent teeth. The thickness of that part of the gum, which projects beyond the sockets, is considerable; so that when it shrinks from the tooth by disease, or is destroyed by boiling or maceration, the teeth appear longer, or less sunk into the jaw. The gum adheres very firmly, in the healthy state, both to the alveolar process and to the teeth, but its ex-

treme border is naturally loose all around the teeth. It approaches, in its substance, to a kind of cartilaginous hardness and elasticity. It is very vascular, so as to be rendered quite red by minute injection; yet it does not seem to possess any great degree of sensibility. For, though we often wound it in eating, and in picking the teeth, much pain is not felt on these occasions; and both in infants and old persons, where there are no teeth, the gums bear a very considerable pressure without pain. The advantages arising from this insensibility are obvious; for till the child has cut its teeth, the gums must perform their office, and be consequently exposed to considerable mechanical force, for which they are formed by having a hard ridge running through their whole length. Old persons, who have lost their teeth, have not this ridge. As the gums are not easily irritated by wounds in a sound state, they are not so liable to inflammation as other parts, and soon heal.

As the teeth are united to the jaw by the periosteum and gums, they have some degree of yielding motion in the living body. This circumstance probably renders them more secure; as by breaking the jar of bony contact, it may prevent fractures both of the sockets, and of the teeth themselves.

Component Parts of the Teeth.

These organs are composed of two substances, differing considerably in their structure and appearance, and existing in very unequal proportions.

The crown of the tooth is furnished with an exterior coat or crust of a substance, called *enamel* (*substantia vitrea, cortex striatus*), which terminates at the neck. This, which in texture and appearance resembles the porcellaneous shells, is the hardest substance in the whole body. It is of a milk-white colour, smooth, or as it were high polished on its external surface; and possessing a kind of semi-transparency in the living state, which is afterwards lost. It presents, on a fracture, a regular fibrous and crystalline appearance; but, in other respects, its texture is homogeneous. It differs so clearly in its colour and structure from the substance which it covers, that, in whatever direction the crown of a tooth be divided, a sharp line, defining the limits of the two parts, can be very readily distinguished. The exterior crust of enamel is thickest on those parts of the teeth, which are opposed to each other in mastication; that is, on the cutting edges of the incisor teeth, and the grinding bases of the grinders. It grows gradually thinner and thinner towards the gums; it is also generally rather thicker on the outer than on the inner surface of the teeth, particularly in the incisors. The fibres of the enamel, generally speaking, have the direction of radii proceeding from the centre of the tooth; but, near the gum, they become inclined towards the surface of the bony part.

The hardness of this substance is such, that it will strike fire with steel, provided the metal be good, and the surface of the enamel broken. It can only be divided by means of a file, as saws, even of the finest structure, do not affect it; and even files are soon worn smooth by it. When exposed to the action of fire, it becomes slightly discoloured, cracks, and flies off from the bone.

No pain is occasioned by filing, perforating, or eroding the enamel in the living subject; nor is there the slightest appearance of reproduction, when it has been partially destroyed or removed.

It acquires a temporary tinge by eating fruits, which have highly coloured juices, as mulberries and black cherries; for it seems, like all other calcareous substances, to attract colouring matters strongly. In this way some people tinge their

their teeth with particular colours, according to their notions of elegance; as the Javaneſe, and inhabitants of the Pelew iſlands.

The poſſibility of imparting an artificial colour to the teeth, *ab externo*, a circumſtance of conſiderable importance in the phyſiology of theſe organs, has been abundantly proved by the experiments of Mr. Moor, an ingenious ſurgeon dentiſt, and lecturer on the teeth, in London. He immerſed them in different coloured fluids, ſuch as ink and bile, and found that their ſubſtance became tinged throughout. He has found alſo that oil penetrates them completely, ſo as to render them tranſparent.

It is not hitherto decided, whether or no the enamel of a growing tooth receives any tinge from feeding the animal with madder; but if it does, the effect is certainly much leſs than that produced on the bony part. When, however, the enamel is formed, it certainly is not affected by mixing madder with the food, except on the external ſurface, which becomes ſtained by mastication. (Blake's Eſſay, p. 132→135.)

Chemical Compoſition of the Enamel.

Enamel conſiſts of phosphate and carbonate of lime, joined to a very ſmall proportion of animal ſubſtance: hence, when immerſed in muriatic or nitric acids, it is diſſolved with a rapid efferveſcence, occaſioned by the liberation of carbonic acid gas. Sulphuric acid ſeems at firſt to have no action; but in the courſe of an hour, ſmall bubbles are perceived; and in twelve hours the enamel burſts, cracks, and ſeparates, accompanied with an evident formation of ſelenite by the action of the acid on the lime. Diſtilled vinegar has a very trifling effect, but operates more powerfully when concentrated.

There is a ſlight flocculent appearance, after diſſolving the bony part of the enamel in dilute nitrous acid, ariſing from the ſmall proportion of animal matter which belongs to this ſubſtance.

The conſtituent ingredients of the enamel are ſtated by Mr. Pepys to be in 100 parts: phosphate of lime 78, carbonate of lime 6, *water* of compoſition 16. Should not the latter be rather conſidered as an animal ſubſtance?

The employment of acids in the living ſubject will impart a very white colour to the teeth; but it ſhould never be reſorted to, as it is extremely injurious by diſſolving the enamel. Cream of tartar (*acidulous tartrate of poſaſh*), containing an exceſs of the tartarous acid, exerts this deleterious ſolvent influence; ſo that a tooth immerſed in it for twelve hours became very rough. (Blake's Eſſay, p. 157.) Yet it is not an unfrequent ingredient of dentiſrices. Theſe powders ought never to poſſeſs any chemical properties; which muſt indeed be completely uſeleſs, if the proper attention be paid to brushing the teeth every morning. For the ſame reaſon, perſons who take nitrous or other acids medicinally, ſhould draw them into the mouth through a glaſs tube. It is in the ſame way, by a ſlight action on the enamel, that eating large quantities of fruit tends rather to whiten the teeth.

The enamel ſometimes ſeems to be depoſited irregularly on the ſurface of the tooth, producing the appearance called honey-comb teeth. It has been aſcertained by Mr. Moor, that this ariſes from inequalities in the bony part, over which the enamel is depoſited. Such teeth are more liable to decay than others. Sometimes, however, we ſee ſpots, in which no enamel has been laid down, and which appear black from caries of the expoſed bony part; and the colour

of the enamel itſelf ſometimes deviates partially from its ordinary appearance.

The uſe of the enamel muſt appear very clearly from the above deſcription of the ſubſtance. It oppoſes a hard and almoſt indelible ſurface to the action of the food which we maſticate. It is, however, at laſt worn off from the expoſed ſurfaces of the teeth, by the long continued and conſtant employment of theſe organs in chewing. And when this takes place, the bony ſubſtance is much more rapidly deſtroyed; ſo that the ſurface of the tooth becomes concave, in conſequence of the external cruſt of enamel reſiſting the trituration longer than the bony part. The enamel is alſo much leſs prone to caries than the oſſeous ſubſtance of the tooth.

Bony Part of the Tooth.

The whole body, with the exception of its exterior ſurface, and the entire fang, are compoſed of what is called the *bone of the tooth*.

The term *bone of the tooth* is here employed in compliance with eſtabliſhed cuſtom, which has arranged the teeth among the bones of the body, and generally induced anatomists to deſcribe them with the bones. The general reſemblance which they bear to bone, particularly in the hardneſs of their texture, and in the nature of their conſtituent elements, has probably led to this arrangement. There are, however, ſo many differences in ſtructure between theſe parts, that we ſhould be fully warranted in aſſerting that the *teeth* are not *bones*. The proceſs, by which theſe organs are formed, is alſo ſo entirely different from the formation of bones, that the term *oſſification* is certainly very improperly uſed, when applied to the development of the teeth, and could only lead us to form erroneous concluſions. To perſons who have not conſidered the ſubject minutely, theſe remarks may appear rather paradoxical. Yet we may repel this charge by obſerving that other anatomists have conſidered the ſubject in the ſame point of view. Eyſſon, who published ſome obſervations on the bones of children, in the year 1659, has the following very juſt remark: "Poſtquam dentium procreatio longe diverſa eſt ab oſſium generatione, liquidem oſſa ſunt per intereſſionem cartilagineum, dentes ex converſione mucoris in dentium ſubſtantiam, opinor dentem non eſſe os, ſed proprium aliquod corpus eſſe, durius, candidius, toidius." (Tractatus Anatomico-medicus de Oſſibus Infantum, Groningæ, 12mo. p. 188.) To this we may add the deciſive opinion of one of the ableſt anatomists of the preſent day. I allude to Cuvier, the learned ſecretary of the French national inſtitute. "We may," ſays he, "ſafely aſſert, that it is very improperly that ſeveral anatomists have given to the internal ſubſtance of the teeth the name of *oſſeous ſubſtance*; and equally improperly have they given the name of *oſſification* to the operation which develops and hardens them. This is to confound two things eſſentially different, and to give, by ill applied names, falſe ideas, which may even have an influence upon practice." (Philoſophical Magazine, vol. xxviii. p. 264. from the Memoires de l'Inſtitut National.)

This is much leſs hard and brittle than the enamel; but it is more denſe and compact than any other bony ſubſtance. It is more inclined to a yellow colour than the enamel; and this is particularly obſervable towards the fang, where it is often at the ſame time ſemi-transparent like horn, and ſofter in its texture. This is deſcribed by Blumenbach as a third ſubſtance of the tooth, by the name of *ſubſtantia cornea*. (Beſchreibung der Knochen, p. 244.) Its fracture has a

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fibrous appearance, and it is susceptible of a very high polish.

It differs from other bone, in never containing any medullary cells, nor indeed any reticular texture, however large the tooth or its cavity may be.

It consists of the same earthy substances with those that belong to the enamel; but they are united to a much larger share of animal matter. The latter constituent exists in the teeth in such abundance, that although their earth be dissolved by acids, the form of the tooth is still retained by a firm cartilaginous substance, which remains. This residue is indeed more dense than that of other bones.

The different proportions of animal matter, contained in the enamel and bone of the tooth, are best shewn by the common method of exhibiting the arrangement of the former substance on the tooth. Let a section of the tooth be made in any direction, and burn the cut surface; then wash it with a weak acid. The bone is perfectly blackened by the action of the fire on its animal matter, while the enamel, consisting almost entirely of earth, retains nearly its original whiteness.

According to Mr. Pepys, the bone of the tooth consists, in 100 parts, of 64 parts of phosphate of lime, 6 of carbonate of lime, and 20 of gelatine. The remaining 10 he sets down as water of composition and loss.

The existence of fluoric acid in the teeth has lately been announced by some foreign chemists; but the fact of its existence, as a component part of these organs, is not yet definitely ascertained. Sig. Morichini of Rome discovered fluoric acid in the fossil tooth of an elephant; and thence was led to examine that of the human subject. He states that 100 parts of it contain 30 of animal substance, and 22 of fluate and phosphate of lime. He supposes the phosphoric acid to be in very small quantity. They contain also some magnesia, alumine, and carbonic acid. The very small proportion of earthy matter, and the large quantity of animal substance, which this analysis assigns to the enamel, differ so much from the results obtained by other chemists, that the accuracy of the experiments must incur suspicion. Mr. Brande could not discover any fluoric acid in the enamel. He powdered it, and subjected it with sulphuric acid to the action of heat; but its presence was not shewn by any action on glass: nor was he more successful by collecting the gas produced by exposing the enamel to heat with sulphuric acid. (Nicholson's Journal, vol. xiii. p. 214.)

Fourcroy and Vauquelin have obtained fluoric acid from tusks and teeth, altered by remaining in the earth; but not from fresh ones. (Philosophical Magazine, vol. xxvii. p. 88.)

Mr. Berzelius of Stockholm states, that he has found fluoric acid both in the bone and in the enamel of the teeth; as also in the bones in general, both in man and in the ox. He gives the following analysis.

Enamel of human Teeth.

Phosphate of lime, - - -	85.3
Fluate of lime, - - -	3.2
Carbonate of lime, - - -	8.0
Phosphate of magnesia, - - -	1.5
Soda, animal matter, and water, - - -	2.
	100

Osseous Part of human Teeth.

Phosphate of lime, - - -	61.95
Fluate of lime, - - -	2.10
Carbonate of lime, - - -	5.50
Phosphate of magnesia, - - -	1.05
Soda, with a little muriate of soda, - - -	1.40
Gelatine, water, &c. - - -	28.00
	100

Nicholson's Journal, vol. xviii. p. 75.

Formation of the Teeth.

This can be best examined, by observing the contents of the jaw of a newly born child. The bone is hollowed out into a number of cells, separated from each other by imperfect bony septa, and rather contracted at their mouths, which are towards the gum. By removing the external or internal plate of the jaw, the contents of these cells are exposed. They consist of membranous bags, called the *capsules* of the teeth, inclosing the rudiments of the bodies of these organs, and certain soft vascular substances, termed the *pulps*, on which the bodies of the teeth are forming.

The bone of the body of the tooth is the part first formed; the enamel is added to this; and the fang appears the last in order.

The *pulp* exactly resembles in shape the body of the tooth, which is to be formed on it. It is a soft vascular substance, and its vessels are most numerous in that part which is covered by the portion of tooth already formed; so that this appears much the reddest after injection.

The *capsule* is a membrane of whitish appearance externally, but very vascular on its inner surface. It includes the pulp, round the basis of which it adheres, and the rudiment of the imperfect tooth. On its outer surface it adheres firmly to the gum; so that if we attempt to tear the last-mentioned part up from the jaw of a fœtus, the capsules and their contents will come away at the same time. These membranes adhere less closely to the bony cells, in which they are contained. The office of the capsule is that of secreting the enamel. Its cavity contains a small quantity of a fluid resembling synovia.

The ossification commences by the formation of the cutting edge of the incisors, and the grinding bases of the grinders. The bony substance being deposited on the pulp, as on a mould, the rudiments of the teeth are necessarily hollow; and the bony layers first formed are those which will be in contact with the enamel, when that substance is deposited. The ossification commences by as many points as there are prominences on the masticatory surface of the tooth. In the incisors there are generally three points; the middle one being the highest, and the first that begins to ossify. The cuspidatus begins by one point only; the bicuspidatus by two, one external, which is the first and the highest, and the other internal. The molares begin by four or five ossifications, of which the external are always the first. When the teeth begin to form by one point only, they gradually proceed, until the ossification is completed. But if there are more points than one, each ossification increases till their bases come in contact, when they unite and proceed in their formation as a simple tooth.

The ossifications in their progress become thicker and thicker where they first began; but they increase faster at the edge, which is always thin and elastic: hence the cavity

of the tooth becomes deeper in the progress of the ossification. As the formation advances, the pulp is gradually surrounded, till the whole is covered by bone, except its base.

The adhesion of the pulp to the newly formed tooth or bone is very slight; for it can always be separated without any apparent violence, nor can we discern any vessels going from the one to the other. It is, however, most strongly attached round the thin elastic edge, which is the last part formed. When the bone has covered all the pulp, it begins to contract a little, and becomes somewhat rounded, making that part of the tooth which is called the neck; and from this place the fangs begin. The formation of the fangs occasions the bodies of the teeth to ascend through the sockets, and afterwards through the gum, which is absorbed in consequence of the pressure of the tooth.

The pulp has originally no process answering to the fang; but as the cavity in the body of the tooth is filled up by the ossification, the pulp is lengthened, and the fang forms over it. The latter part grows in length, till the whole body of the tooth is pushed through the gum: the socket, at the same time, contracts at its bottom, and grasps the neck or beginning fang, adheres to it, and rises with it. This contraction is continued through the whole length of the alveolus as the fang rises; or the socket, which contained the body of the tooth, being too large for the fang, is wasted or absorbed into the constitution, and a new alveolar portion is raised with the fang: whence in reality the fang does not sink or descend into the jaw.

Both in the body and in the root of a growing tooth the extreme edge of the ossification is so thin, transparent, and flexible, that it seems to be rather horny than bony; very much like the mouth or edge of the shell of a snail.

As the tooth grows, its cavity becomes gradually smaller, especially towards the point of the fang. It is formed by a successive deposition from without inwards; the exterior lamina, or that which adjoins the enamel, being the first formed, and the succeeding layers being added within this. Thus the cavity is gradually diminished, as the ossification advances; and it is always proportionally largest in the most incomplete teeth.

In tracing the formation of the fang of a tooth, we have hitherto supposed it to be single; but where there are two, or more fangs, it is somewhat different, and more complicated.

When the body of a molaris is formed, there is but one general cavity in the tooth, from the brim of which the ossification is to shoot, so as to form two or three fangs. If two only, then the opposite parts of the margin of the cavity shoot across where the pulp adheres to the jaw, meet in the middle, and thereby divide the mouth of the cavity into two openings, from the edges of which the two fangs grow. Sometimes a distinct ossification begins in the middle of the general cavity upon the root of the pulp, and two processes, coming from the opposite edges of the bony shell, join it; which answers the same purpose as the more ordinary structure. When there are three fangs, three processes come from as many points of the brim of the cavity, meet in the centre, and divide the whole into three openings; from which the three fangs are formed.

When the surface of the tooth first appears through the gum, the formation is far from being completed: the body is at this time much hollower than in the perfect tooth, and the fang is only in an incipient state. The hollow of the body is gradually filled up, and the fang is lengthened in proportion as the tooth rises through the gum. Even when

the whole body has passed the gum, the formation of the root is not completed, as it still remains hollower than in the perfect tooth.

When the bone of the body of the tooth is somewhat advanced in its formation, the enamel begins to be deposited on its surface, from the vessels of the capsule. This deposition commences on the malting surface of the tooth, and thence extends towards the root. It is first soft and moist, and presents a rough appearance when dried. It continues in this state until it has acquired the full degree of thickness, when it becomes white and hard, and assumes its natural shining and polished surface. The deposition of this substance is completed when the fang of the tooth begins to form; for at that time the body penetrates the gum, and thereby lays open the capsule, which will be found at this period to have undergone great alteration in its texture and appearance. Instead of the soft vascular surface, which it exhibited while the deposition of the enamel was proceeding, it is now dense, compact, and almost tendinous, with very few blood-vessels. The capsule, which before possessed no adhesion to the tooth, becomes connected to it when the formation of the fang commences; and it forms the peristeme of the fang. Mr. Hunter states, that the enamel is deposited from a pulp, analogous to that on which the bone forms. There is no foundation for this assertion; and the mistake, which has been noticed by Blake in his valuable Essay (chap. iv.), arose probably from the situation of the rudiments of the permanent incisors behind, and close upon the capsules of the temporary ones at the time of birth; and partly also, perhaps, from the analogy of graminivorous quadrupeds, where pulpy processes descend from the capsule into the teeth, to deposit the processes of enamel, intermixed with the bony substance of the organ.

The regular striated appearance of the enamel has led some to suppose, that it forms on the tooth by a process of crystallization; being contained in a dissolved state in the mucous fluid, which exists in the cavity of the capsule. We cannot attach much weight to this explanation, when we consider that that fluid does not contain a greater proportion of phosphate of lime than other similar animal liquors; that the deposition, in the teeth of some animals, is confined to a particular part of the tooth; and that there are instances, occasionally, in which a small spot has no enamel.

Classification and Description of the adult Teeth.

The whole number of the adult teeth is thirty-two; and they are equally divided between the two jaws, so that each of these contains sixteen. Occasionally there are only twenty-eight or thirty. Of the sixteen teeth contained in each jaw, those on the left side are just the same with those on the right, so that they are arranged in pairs; and the teeth in the upper jaw nearly resemble those of the lower jaw in situation, figure, and use.

The teeth have been commonly divided into *incisors*, *canine*, and *grinders*. This arrangement is not adopted by Mr. Hunter, who substitutes in its place a more eligible one. He distributes these organs into four classes. 1. The *incisors*, or cutting-teeth, which include the four front ones of each jaw. 2. *Cuspidati*, two in number; one on each side of the incisors. These were formerly called *canine teeth*, from a comparison to the corresponding ones in the dog, and other carnivorous animals, to which they bear no resemblance. 3. *Bicuspides*, four in each jaw, two on either side. These are most clearly distinguished by their smaller size from the back teeth, with which they were before included,

cluded, in the common denomination of grinders. 4. *Molares*, six in number, three on each side, behind the bicuspidates.

There is a regular gradation, both in growth and form, through these classes, from the incisors to the molares; in which respect the cuspidati are of a middle nature between the incisors and bicuspidates, as the last form the connecting link between the cuspidati and molares. Consequently the incisors and molares are the most unlike in every circumstance.

The following description is taken from the teeth of the lower jaw, and the differences between these and the upper teeth are noticed subsequently.

The *incisor teeth* (*primores* of Linnæus; *tomici, risorii*) have an anterior and posterior flat surface, which meet in a cutting edge. The anterior surface is convex, and placed almost perpendicularly; the posterior is concave, and sloping, so that the cutting edge is directly over the front surface.

The two surfaces are broadest at the cutting edge, and they grow gradually narrower from that part to the neck. The side of the tooth, on the contrary, is narrowest at its cutting edge, and becomes thicker and thicker towards the neck; so that it is of a wedge-like form. The fang, on the contrary, is compressed laterally; so that its sides are broadest, and the anterior and posterior surface are narrowest. It follows, therefore, that an incisor tooth, when viewed on its anterior or posterior surface, is broadest at the cutting edge, and grows constantly narrower to the extremity of its fang; but in a side view, it is thickest or broadest at its neck, and thence becomes gradually more narrow, both to its cutting edge and to the point of its fang. The enamel is continued farther down, and is thicker on the anterior and back part of the incisors than on their sides; it is also rather thicker on the fore part than on the back of the tooth. They stand almost perpendicularly; their bodies being turned a very little forwards. The two middle ones are smaller than the two exterior: they are indeed the smallest teeth in the mouth, and are distinguished by the epithet of *small incisors*, from the lateral ones or *large incisors*.

The upper incisors are considerably broader, thicker, and stronger, than the corresponding lower teeth. The two middle ones are considerably the largest, and are distinguished by the term of *large incisors*. The fangs of these teeth are round, instead of flattened, especially those of the large incisors. They project in front more than the lower teeth, so that their axis points downwards and forwards; and they usually overlap those of the lower jaw to a small extent.

The upper large incisor covers the lower small ones and half of the large; and the upper small one covers the other half of the lower large incisor, and more than half of the cuspidatus. The edges of these teeth generally become blunt and thicker by the friction of mastication; but in some persons they are rendered thinner by the mutual attrition.

The Cuspidati (Canini of Linnæus; canini).

These teeth are thicker and stronger than the incisors, possessing a large and long fang, which causes a marked prominence of the outer plate of the alveolar process. Their body, which is thick, and nearly cylindrical at the root, terminates above in a point, which projects beyond the other teeth, particularly in the lower jaw. Their fang is compressed laterally, and occasionally divided through its lower half, into two. Their sides are more extensively covered

with enamel than those of the incisors: and they stand almost perpendicularly. They are considerably larger in the upper jaw; and their fangs are longer than those of any teeth; from which circumstance they have acquired the name of *eye-teeth* in common language.

When the jaws are closed, the upper cuspidatus falls between the lower corresponding tooth, and the first bicuspid; and projects a little over them. Their points are soon worn away by mastication, and then they rather resemble the incisors, but as the friction goes on the worn surface is much more cylindrical.

The Bicuspidates.

The two bicuspidates resemble each other so much, that a description of the first will serve for both. The first indeed is frequently the smallest, and has rather the longest fang, approaching more nearly than the second to the shape of the cuspidatus. Its body is flattened laterally, and it terminates above in two obtuse tubercles, an external, and an internal one; of which the former is the longest and thickest; so that on looking into the mouth from without, this point only can be seen, and the tooth has very much the appearance of a cuspidatus. The internal point is the least, and indeed sometimes so very small, that the tooth greatly resembles a cuspidatus in any view. It is broadest in the lateral direction at the union of the two points, and thence it diminishes to the pointed extremity of the fang. The fang itself, which is broad, and compressed laterally, is sometimes forked at its extremity. The enamel extends nearly equally all round the neck of these teeth. They stand perpendicularly in the jaw.

In the upper jaw they are more flattened laterally, and broader from within outwards, than in the lower; and are inclined a very little forwards and outwards. They possess here frequently two fangs, instead of the single broad one which they have in the lower jaw; but the division does not in general extend to the neck of the tooth, when there is only one broad fang, it contains two cavities; one towards each margin. The first upper bicuspid falls between the two corresponding lower teeth; the second between the second lower bicuspid, and the first grinder; and they project a little over those of the lower jaw.

These teeth are more frequently wanting than any others, excepting the dentes sapientia.

Molares, or Grinders.

The first and second of these nearly resemble each other in their form, so that they may be considered together: the third differs from these in some circumstances.

The grinders differ from the bicuspidates, in being much larger; in having more numerous points on the body, and more fangs. Their grinding base forms a square, with rounded angles. The surface has commonly five points or protuberances; two of which are on the inner, and three on the outer part of the tooth: there are also generally some smaller points at the root of these larger protuberances. These inequalities, being situated at the margins of the grinding basis, leave an irregular superficial cavity in the middle of the tooth. The three outer points do not stand so near to the outer edge of the tooth, as the inner ones do to the inner margin; so that the body swells more from the points, or is more convex, on the outer surface. The body is but slightly contracted at the neck, where it divides into two broad and flat fangs, an anterior and a posterior one, which are generally bent a little backwards. The flat surfaces of these fangs are placed directly across the jaw, so that

that one is precisely *anterior* and the other *posterior*; their edges are turned towards the two plates of the alveolar process, and are consequently *exterior* and *interior*. They continue broad nearly to their extremities, which are sometimes bifurcated. There are two cavities in each fang: one towards each edge, leading to the general cavity in the body of the tooth. The fang is therefore thicker at these parts, and thinner in its middle, where it is marked externally by a longitudinal groove. The enamel is much thicker on the grinding surface of these teeth than in other parts, but it terminates at the same line all round the neck.

The first grinder is somewhat larger and stronger than the second; it is turned a little more inward than the adjacent bicuspides, but not so much as the second grinder. Both of them have generally rather shorter fangs than the bicuspides.

There is a greater difference between these grinders in the upper and lower jaw, than in any of the other teeth.

They are rather rhomboidal than square in the upper jaw; having one sharp angle turned forwards and outwards, the other backwards and inwards. They have three smaller and round fangs, which diverge and terminate in a pointed manner; each of them having a simple cavity. Two of these are placed near each other, perpendicularly over the outside of the tooth; and the other, which is generally the largest, stands at a greater distance on the inside of the tooth, slanting inwards. They are inclined outwards and a little forwards; projecting slightly over the corresponding teeth of the lower jaw, and placed further back in the mouth, so that each is partly opposed to two of the lower jaw. They are placed directly under the maxillary sinus, and the second is rather the smallest of the two.

The third molaris in each jaw is called, from the circumstance of its appearing late in life, *dens sapientia*, or the *wise tooth*. It is shorter and smaller than the others. Its body is rounder, but possesses the same general formation with the other grinders. The fangs are not so regular and distinct; generally appearing as if squeezed together into one; and sometimes there is only one thick conical fang. It varies more in the upper than in the lower jaw; and is smaller in the former than in the latter, so as to be directly opposed to it. And but for this circumstance the grinders would reach further back in the upper jaw than in the lower.

When the natural number of the teeth is less than usual, it arises from a want of these *denes sapientia*.

General Observations on the Teeth, as viewed in Conjunction.

From the incisores to the first grinder, the teeth become gradually thicker at the extremity of their bodies; and smaller from the first grinder to the *dens sapientia*. From the cuspidatus to the wise tooth, the fangs become shorter; the incisores are nearly of the same length with the bicuspides.

From the first incisor to the last grinder, the teeth stand out less from the sockets and gum.

The bodies of the lower teeth are turned a little outwards at the front of the jaw; and thence to the third grinder they are inclined gradually more inwards. The upper teeth project over those of the under jaw, especially at the forepart, where the cutting edges of the upper incisores overlaps that of the lower, so that they act like the blades of a pair of scissors. This arises from the upper teeth being placed more obliquely, for the circle of the sockets is nearly the same in both jaws. This obliquity becomes constantly less from the incisores to the last grinder; so that instead of overlapping, the outer edge of the upper

teeth projects a little over the opposed margin of the lower ones.

The teeth in the upper jaw are placed farther back in the circle, than the corresponding ones in the lower; in consequence of the upper incisores, particularly the two front ones, and the cuspidati being broader than the lower teeth. Yet this is compensated by the lower back grinders being larger than the upper ones, so that the upper *dens sapientia* falls on the surface of the lower one.

The size of the fangs bears a proportion to the bodies of the teeth for reasons which must be obvious. They seem to be rather less firmly fixed in the upper than in the under jaw, or, in other words, the alveolar process is strongest in the former. This difference may be partly accounted for by the situation of the antrum. The upper grinders, instead of possessing two strong and straight fangs, have three smaller diverging ones, inclosing, as it were, the bottom of the antrum. That all this weakness of the upper jaw is for the increase of the antrum, is rendered probable by considering that the upper teeth are generally similar to those of the lower jaw, excepting just where they are opposite to the maxillary sinus; and here they differ principally in the fangs, without any other apparent reason. And this is further confirmed by observing, that the *denes sapientia* of both jaws are more alike than the other grinders, because they do not interfere so much with the sinus.

The arch formed by the teeth altogether is generally parabolic, sometimes elliptical, but very rarely semicircular. Sometimes it forms nearly a straight line in front, and this joins the sides by two angles. It is more capacious in the upper than in the lower jaw, on account of the greater breadth of the front teeth; but the difference is trivial at the back part.

The line formed by the junction of the teeth is not perfectly straight, being slightly elevated before and behind, and depressed in the middle. Hence the front and back teeth of the lower jaw are rather higher than the middle ones, in order to meet the upper teeth.

The arch of the teeth forms a simple line at the anterior part of their masticating surface: but from the point of the cuspidatus backwards, in consequence of the breadth of the bicuspides and molares, there is a double line, constituting an outer and an inner margin.

The number and disposition of the teeth are usually found as we have above described them. There are occasionally supernumerary ones, which are most frequent about the incisores and cuspidati of the upper jaw. And sometimes, where the number is not greater than usual, from want of room or other causes, the teeth deviate in various ways from their ordinary position, so as even, in some instances, to give the appearance of a double row in the front of the mouth. The exact description, and the mode of remedying such deformities, fall within the province of the dentist.

Wearing of the Teeth by Mastication.

The true and exact form of the teeth can only be observed just after they have appeared in the cavity of the mouth.

For afterwards, the constant friction, which they experience in the act of mastication, wears away their opposed surfaces, and thereby changes their form. Thus the incisores, which at first possess three prominent points on their cutting edge, soon have these projections removed; the apex of the cuspidatus is speedily worn off, so as to render the body obtuse; and the prominences of the grinders are removed in the same manner at a more remote period. Af-

ter a certain time the enamel is consumed from the masticating surfaces of the teeth; this happens tolerably soon in the incisors and cuspidati. After the exposure of the bone the tooth wears down much more rapidly while the superior hardness of the enamel causes that part to resist longer and thereby to form an elevated margin. The body is at last consumed in the progress of time down to the very neck; and it is obvious that the cavity would be exposed by this process, were it not filled up by new matter, in proportion as the surface is worn off. This newly formed matter may be readily distinguished as it forms a more transparent spot in the middle of the tooth. The effects of the friction of mastication on the teeth are most strikingly exhibited in the crania of savages; or of such persons as have lived most nearly in a state of nature, or on the most simple kinds of food. Here we often find the grinders with their prominences destroyed, and worn down to a level surface. This may be partly accounted for by the food being less softened by the artificial aid of the processes of cookery, and partly by the natural effects of attrition being anticipated in us by caries of these organs.

It must be obvious from this description, that there is no process of reparation going on in the teeth to supply the loss of substance occasioned by mastication. We shall prove in a subsequent part of the article that these parts possess no vessels nor nerves, and that they must consequently be completely incapable of such processes. How indeed can we suppose, that organs destined for the mechanical reduction of the food, and which therefore can only be compared to mill-stones, should be indued with vascularity and sensibility? These parts are constantly becoming less after they have cut the gum, by their surface wearing away in the manner above described. Yet in some books even of such distinguished authors, as ought to have been better acquainted with the subject (for instance, in Monro's very excellent description of the Bones, p. 115.) it is stated that they are constantly growing larger. The proofs of this fact are said to be, that when an upper or lower tooth is lost, the opposite one grows longer, and that the teeth before and behind the vacancy grow broader. The appearances in these cases are truly stated; but we have a more natural solution of them, than by the hypothesis of ascribing vascularity to the teeth. When a tooth has lost its opposite one of the other jaw, it seems to become longer than the others, in proportion as these have become shorter by abrasion; which cannot now affect the apparently lengthened tooth. The effect may possibly be further increased in this instance by the loss of pressure giving the alveolar process of the opposite tooth a disposition to rise higher, and fill up below. Where the interval left by a fallen tooth seems to be contracted by the increased thickness of the adjacent teeth, the appearance is occasioned by the teeth moving from that side, where they are well supported, to the other side, where they are not. Thus they get an inclined direction, which extends to the adjacent teeth in a proportionally less degree, and affects those which are behind, more than those which are before the vacant space. This kind of effect is most observable in the lower jaw, where the back teeth are naturally inclined forwards.

Use of the Teeth.

The grand utility of the teeth in masticating the food, will be considered under the article MASTICATION. They are moreover of great service in the pronunciation of several letters; particularly the front teeth, the loss of which occasions a peculiar defect of the speech, called lispings. The loss of all the teeth, and the alveolar processes in old

persons, still further impedes pronunciation by obstructing considerably the motions of the tongue.

Are the Teeth of Man Carnivorous?

We cannot decide this question better than in the words of Mr. Hunter: "Natural historians have been at great pains to prove from the teeth, that man is not a carnivorous animal; but in this, as in many other things, they have not been accurate in their definitions; nor have they determined what a carnivorous animal is. If they mean an animal that catches and kills his prey with his teeth, and eats that flesh of the prey, just as it is killed, they are in the right; man is not in this sense a carnivorous animal, and therefore he has not teeth like those of a lion; and this, I presume, is what they mean.

"But if their meaning were that the human teeth are not fitted for eating meat that has been caught, killed, and dressed by art, in all the various ways that the superiority of the human mind can invent, they are in the wrong. Indeed from this confined way of thinking, it would be hard to say what the human teeth are fit for; because, by the same reasoning, man is not a graminivorous animal, as his teeth are not fitted for pulling vegetable food, &c. They are not made like those of cows or horses, for example.

"The light in which we ought to view this subject is, that man is a more perfect or complicated animal than any other; and is not made like others, to come at his food by his teeth, but by his hands, directed by his superior ingenuity; the teeth being given only for the purpose of chewing the food, in order to its more easy digestion. These as well as his other organs of digestion, are fitted for the conversion of both animal and vegetable substances into blood; and thence he is enabled to live in a much greater variety of circumstances than any other animal, and has more opportunities of exercising the faculties of his mind. He ought therefore to be considered as a compound, fitted equally to live upon flesh and vegetables."

Of the Temporary Teeth.

The teeth being, as we have already observed, destitute of any principal of growth within themselves, have not the power of increasing in size as the jaws grow. Hence the small teeth, which occupy the alveolar processes of the child, are discharged, at a certain period, to make room for a new set, adapted in form and magnitude to the dimensions of the adult jaw. The former are therefore distinguished by the epithets of the *temporary* or *deciduous* teeth, from the latter, which are called the *adult* or *permanent* set.

There are ten temporary teeth in each jaw; consisting of four incisors, two cuspidati, and four grinders. In position and form these resemble the corresponding permanent ones, which have been already described; and the chief difference consists in their being very much smaller. The temporary set contains therefore no teeth corresponding to the adult bicuspidates. The cuspidatus has a more pointed form than in the adult; and the front grinder is smaller than the posterior one.

Formation and Time of Appearance of the Temporary Teeth.

At the ninth or tenth week after conception there is a simple longitudinal groove in the jaw; containing a soft jelly-like vascular substance, without any distinction of parts; at the fifth month bony partitions begin to shoot across the alveolar grooves; the pulps and capsules can now be distinguished, but are still in a gelatinous state; small hollow shells have formed on the incisors and cuspidati, and ossification

erian has commenced by some angular depositions on the points of the grinders. The canal of the vessels and nerve is open at the bottom of the alveolar groove, and the capsules adhere so strongly to the gum, that they come away, if that part be torn up from the jaw.

In the full-grown fœtus, the rudiments of the teeth are contained in almost complete bony cells. The different capsules are separated by bony septa; and the mouths of the cavities, which are situated towards the gum, are rather contracted in order to support that part, and to prevent the still imperfect rudiments from being injured by any mechanical pressure. At this time the pulps of the incisors and cuspidati are nearly covered by bony shells; the points of ossification of the grinders are united or very nearly so. There are the rudiments of six teeth in each side of the jaw at this time; *viz.* of the five temporary ones, and of the first or anterior adult grinder, which is contained in the same bony cell with the second temporary molaris; and is situated under the coronoid process of the lower jaw, and in the tubercle of the upper.

As ossification does not commence on all the pulps at the same time, those on which it first commenced are in general the soonest completed, and of course they appear through the gum first. At the time of birth the bodies of the middle incisors of both jaws are the most perfect; the lateral incisors and the small grinders are the next in order; and the cuspidati and large grinders are the least complete. In general the teeth begin to appear about the sixth, seventh, or eighth month after birth; but there are some exceptions to this rule; owing to the rapid progress of ossification in some children, and the slowness of it in others. There are a few instances of children at birth having one or two of the incisors already cut, and in such cases it is often necessary to remove them immediately; on the contrary, in children apparently healthy they have not begun to appear till the first, second, and even the third year. For the most part they appear in pairs; that is, the two corresponding teeth on either side of the jaw come through the gum at the same time. The first teeth are the middle incisors of the under-jaw, and in a few weeks after the middle incisors of the upper appear. In a month or six weeks afterwards, we have reason to expect the under lateral incisors; which are followed in a short time by those of the upper jaw. About the twelfth or fourteenth month the under anterior grinders appear, and those of the upper jaw about the same time. At the sixteenth or twentieth month the cuspidati appear, and first in the lower jaw. The posterior or large grinders come through the gum from the twentieth to the thirtieth month. Thus, in general, about the second or third year, the twenty temporary teeth are complete. We must not however expect to find the teeth always appear in the precise order which has been just described. Some irregularities are frequently met with; such as, one tooth appearing a considerable time before its fellow; all the incisors of the under jaw before any of the upper; or the reverse, which is very rare. The anterior grinders sometimes come through before the lateral incisors; and the posterior grinders before the cuspidati; but the cuspidati are never cut before the small grinders. Three or four teeth sometimes appear nearly at the same period. The small grinders have been known, in a very few instances, to come through first of all.

Formation, and Time of Appearance of the permanent Teeth.

The adult teeth are formed in the same manner with those of the temporary set; and their capsules are contained

in peculiar cavities of the jaws, situated for the most part near those of the deciduous clats.

The rudiments of the incisors and canine teeth are found at the time of birth closely adherent to the posterior surface of the capsules of the temporary ones, as Eustachius has justly observed. At this time, therefore, they are contained in the same sockets with the deciduous teeth; and there is a very distinct foveola on the inner plate of the alveolar process at this period, caused by the situation of the adult large incisor, the pulp of which is now tolerably advanced.

The fics of the permanent teeth, situated as we have just mentioned, are so intimately connected with the membranes of the temporary set, that they cannot be separated without tearing one or both. As their formation proceeds, they become surrounded by a complete bony cell, which, as the temporary teeth rise in the jaw, is situated below and behind them in the lower maxilla, above and behind them in the upper jaw. Ossification has commenced on these teeth at the age of six or seven months. Their formation is considerably advanced at the age when the temporary incisors have appeared. The ossification of the lower adult cuspidati has now commenced, and the pulp of the upper cuspidati is formed; this begins to ossify about the sixteenth month.

The capsules of these permanent teeth are connected to the gum by processes passing through certain openings of their bony cells, which form small foramina just behind the corresponding temporary teeth.

As the adult incisors and cuspidati form in that portion of the jaw which holds the analogous temporary teeth, and are so much larger than these, they are consequently crowded; the lateral incisors are rather behind the middle ones, and the cuspidati are placed at a great distance from the alveolar portion of the jaw; being just under the orbital plate of the upper maxillary bone, and close to the basis of the lower jaw. Hence the process connecting its capsule to the gum has the appearance of a slender thread passing through the bone.

The adult bicuspides form over and under the temporary molares. Ossification has commenced on the points of these in the lower jaw about the third year, and they are all considerably advanced at the age of six years.

The adult molares are not formed in the neighbourhood of any temporary teeth, but completely behind them. These are successively produced under the coronoid process of the lower jaw, and in the tubercle of the upper. The anterior grinder is the first permanent tooth that can be discovered. This is discerned some time before birth; and ossification has commenced on one or more of its points at the time of birth. At the fourth year this grinder has left its original situation under the coronoid process and in the tubercle, and has advanced in the jaw. Its place is supplied by the second grinder, which comes forwards in the same way; and the situation of this tooth is occupied at the eighth or ninth year by the dens sapientie, which then begins to form.

The various teeth of the adult set proceed in their formation in the situations just described until they have attained such a state of perfection as to come through the gum. The temporary teeth are then shed to make room for them. This is effected by the gradual absorption of their fangs, which being completely removed, the neck only holds by the gum, and the tooth then falls out with the slightest force. The appearance of the temporary teeth, when thus discharged, has led some to the erroneous idea that they possess no fangs.

C R A N I U M.

It has been often stated, that the absorption is produced by the pressure of the new teeth, which mechanically push out the old ones. But that this is not true, is shown by this circumstance, that the fangs are often absorbed long before the permanent tooth appears; and sometimes even where no permanent tooth succeeds. On the contrary, some of the deciduous set occasionally remain in the jaw among the adult teeth. This is the case where no corresponding permanent teeth are formed; so that, if the absorption of the temporary fangs be not owing to any actual pressure, the formation of the permanent set must considerably influence the process. The temporary incisors, both of the upper and under jaw, sometimes continue during life; and occasionally one or more of the bicuspidis are wanting. A person has been known to have only four teeth of the permanent set in each jaw. (Fox's "Natural History of the Human Teeth," p. 41.) The shedding of the teeth generally commences at the sixth or seventh year. The rising of the permanent tooth destroys the partition which separated its cell from the temporary socket, through which therefore the adult tooth appears. But if the fang of the temporary tooth should not have been absorbed in proportion to the advancement of the permanent one, the latter protrudes at the opening through which its capsule was connected to the gum, so as to appear behind the temporary tooth.

The membranous processes, which pass through the foramina of the jaws to connect the capsules of the permanent teeth to the gum, seem to have been first noticed by Blake, although the openings themselves, and their situation, were known to, and accurately described by Albinus. The former author considers the rudiments of the permanent teeth to be processes of the temporary capsules, and that the membranes unite the permanent capsules to the necks of the temporary teeth. To us this representation has never appeared quite correct: the capsules of the permanent incisors and cuspidati, when they can be first observed, are contained in the same sockets with the temporary teeth, and undoubtedly are most closely connected to their capsules; but when they have become included in complete bony cells, the connection between the two sets ceases; the process which goes through the opening of the jaw to the gum has no particular connection to the temporary tooth, except inasmuch as the gum adheres to the neck of the tooth. That the permanent capsules in some instances are not at all formed by any processes of the temporary ones, is evident from the bicuspidis; the rudiments of which are not perceptible until after the child's grinders have completed their growth. Neither have we noticed that connection, which Blake speaks of, between the first and second, and the second and third adult molares. (See his fourth chapter.)

It will be easy, from what we have already said, to determine the number of teeth which are formed and forming in the jaw at any given time. Thus at the time of birth there are in each jaw the rudiments of the ten temporary teeth; of the two anterior molares; and those of the adult incisors at least, in an incipient state, if not of the cuspidati. The greatest number is found in the jaw, just before the shedding of the teeth commences; that is, about the sixth year. There are then twenty-four teeth in each jaw-bone; *viz.* the ten temporary ones, and all the permanent set, excepting the *dentes sapientie*. It is stated however by Blake, who, in his over-zealous zeal to detect every trivial mistake of Mr. Hunter, not uncommonly commits errors himself, that there is a greater number in the jaw at the age of four years; and he makes this number amount to twenty-six, which includes the whole of the deciduous and permanent

set. We have never found the *dentes sapientie* beginning to be formed at so early a period as this; but if they begin very soon, or the shedding does not commence until late, there may undoubtedly be twenty-six teeth in each jaw at once, although this is not usual.

The usual time for the shedding of the teeth to begin is about the sixth or seventh year; it may commence as early as the fifth, or be delayed until the eighth. The anterior molares being rather earlier in their formation than the incisors, usually appear first; and soon after these have been cut, the shedding of the temporary teeth may be expected to begin. The central lower incisors are first removed, and succeeded by the permanent ones: those of the upper jaw appear about two or three months after. The lateral incisors of the under jaw follow next in succession, and then those of the upper. The temporary molares begin to loosen in about six or twelve months more, and are usually shed before the cuspidati. The first bicuspidis come into the place of the anterior grinders about the ninth year; and soon after the temporary cuspidatus is succeeded by the permanent one. The second temporary molaris then gives place to the posterior bicuspidis; and the middle permanent molares appear about the twelfth year; the last grinders, or *dentes sapientie*, usually come some time between the seven-teenth and twenty-third year; although occasionally they are not cut until a much later period of life.

In some rare instances a greater or smaller number of teeth has appeared at very late periods of life, and have been described as constituting a *third set*. The individuals in whom this circumstance has been observed, have invariably been considerably advanced in years, yet strong and healthy for their age. Lord Bacon states that the countess of Desmond was an example of this occurrence. ("Works," vol. 3, p. 152.) Mr. Hunter knew an instance in which two fore teeth appeared in the lower jaw late in life. (p. 85.) John Moore, aged 102, the oldest man at present in Chelsea Hospital, has had four new front teeth within the last five years. Sir John Sinclair, who mentions this circumstance, ("On Health and Longevity," Appendix to vol. 2, p. 147.) cites other instances; and one of them is a person whom he himself saw. He found the new teeth of a softer consistence than teeth usually are, and he considered them as imperfect in their formation. In the last volume of his ("Elements of Phytology," part 2, p. 85.) Haller has collected several cases mentioned by preceding authors. These evidences must be allowed to prove clearly that teeth have appeared at a late period of life, although the number in any one instance has been small, and the examples of the occurrence very rare. It has never occurred to any anatomist to detect the rudiments of these teeth in the jaw, during their formation; and perhaps a strict examination might shew that in some instances the appearance has only arisen from some of the permanent teeth being cut unusually late: as we know that the cutting of these teeth is sometimes delayed for many years beyond the usual time. At all events, we ought not to admit any case as clear proof of the fact, unless it could be ascertained that the person in whom it appeared had had the two ordinary sets of teeth, consisting each of its natural number, and this probably has not been made out in any one instance. The "Account of a Case of three different Growths of Teeth succeeding one another in the Jaw of a Child," in the third volume of the London Medical Observations and Inquiries, is so imperfect and omisive, that we can draw no conclusions from it.

CRANIUM.

Form of the Jaws as influenced by the Teeth.

These bones may be said perhaps to grow equally in all directions until the time of birth. Yet in the latter months of fetal existence they probably increase rather more towards their posterior part than in other situations; for although about five months we find only five rudiments in each side of the bone, there are six discoverable at the seventh or eighth month; and the sixth occupies the situation which was before filled by the fifth.

At twelve months after birth, the ten temporary teeth are tolerably complete in their size; and, after this time, the jaws grow no more in that part which holds these teeth, than in proportion to the difference of size between the deciduous and temporary teeth. The front arch of the jaw is therefore very nearly as large at this time as in the adult, and hence the face of the child has a flattened appearance at its anterior part.

But these bones still increase very considerably towards their posterior parts; and as they do so, the adult molares advance successively from the tubercle of the upper jaw, and the coronoid process of the lower. The sixth tooth (first adult molaris), which was in these situations in the newly-born child, has advanced completely in front of them at the age of four years, when its place is occupied by the second adult grinder, which coming forwards in the same way, as the jaw increases at its posterior part, is succeeded by the third, or dens sapientie; and this last advances into the alveolar circle at a later period.

There are also most remarkable changes at different periods in the alveolar portions of the jaws. The substance of the bones is hollowed out into cells at the time of birth to contain the rudiments of the forming teeth; but alveolar processes in the proper sense of the term cannot be said to exist at this period. The gums in the upper jaw are nearly on a level with the glenoid cavity of the temporal bone; and in the lower jaw with the condyle. The surface of the palate is nearly level. As the teeth advance into the mouth, the margin of the jaw is lengthened into an alveolar process, so that the gum is now very considerably below the level of the glenoid cavity. The ramus of the lower jaw must be proportionally lengthened; and still more so, as the breadth of the lower jaw is equally increased with that of the upper, by the growth of the alveolar process. This increased depth of the jaws, with the addition of the teeth, must of course very greatly lengthen the face; which recovers its former shortness in old age by the loss of the teeth, and the consequent removal of the alveolar processes. A diminution is hence effected of not much less than two inches in some cases. The edge of the upper gum now again is on a level with the glenoid cavity; and the palate, instead of its strongly-arched form, is again nearly flat. The length of the ramus of the lower jaw cannot however be altered; hence it shuts in front over the upper one, so as to bring the upper and lower gums into contact at the back of the mouth, where the greatest force can be exerted in mastication. If the jaws of a toothless person came in contact in their anterior part, they would not touch behind. The degree of diminution in breadth of the lower jaw may be easily estimated by comparing the situation of the foramen mentale. This opening in the perfect jaw is rather nearer to the under than to the upper margin of the bone; but after the loss of the alveolar process, it is close on the upper edge.

Are the Teeth Vascular?

The question concerning which anatomists and physiologists are divided in opinion on this subject is, whether the

bone of the tooth possess any vessels or nerves in its substance, so as to be capable of those actions and changes which we may observe in other vascular and living parts? Or whether it be destitute of vessels and nerves, unpossessed of vitality, and obnoxious to such changes only as can be effected by mechanical and chemical agency? The arguments in favour of the latter opinion are beyond all comparison the most numerous and direct, so that we cannot help being greatly surpris'd that the opposite sentiment should have acquired any partizans amongst persons acquainted with the structure, formation, and diseases of these organs. In considering this question, the enamel does not come under our observation; as that part is allowed to be destitute of vessels, even by the persons who argue for their existence in the bone of the tooth; and we shall, therefore, in the following discussion, assume that it is not vascular.

The office which the teeth perform affords a strong presumption against their possessing vessels and nerves. Is it at all probable that a vascular and sensible part should be destined to perform the trituration of the different hard bodies, which constitute our food, and be exposed to the mechanical attrition which this office must necessarily occasion? Here it may be said, that the enamel is an insensible external covering, intended to resist the effects of the hard bodies, which are masticated, and to protect the vascular and sensible bone. But the time comes, when the enamel being worn away, the bone of the tooth is itself exposed to friction, and exposed in that part where the greatest effects are produced. Another argument, to the same effect, arises from the formation of two sets of teeth. As these organs are formed at once of the size of which they always remain, and as the jaw-bone, which contains them, increases like all other vascular parts of the body, the teeth of the child do not correspond in size to the jaw of the adult: hence, the necessity of a second set of teeth. Surely, if these organs were vascular; if they possessed in themselves the means of growth they would increase, so as to accommodate themselves to the size of the jaw, and we should not have this tedious and complicated process of forming a new set of teeth, of discharging the old ones to make room for these, and of bringing them forwards at long and regular intervals; a process which gives rise to so many troublesome complaints, and affords so much employment for the dentist.

The teeth never exhibit any appearances of reparation, under circumstances of accidental injury, or of supposed disease. The loss of substance occasioned by the friction of mastication is not repaired; a part broken off is never renewed, but the fractured surface remains unchanged; a hole occasioned by decay is never again filled up. None, in short, of those processes of restitution, which so strikingly characterize all organized bodies, for which alone powers of life and growth can ever be required, take place in the present instance; so that if the teeth possess vessels, they exist to no purpose, and manifest their presence by none of the usual phenomena.

Such is, precisely, the reasoning employed to shew that the enamel is not vascular: and every argument, tending to prove that position, will apply with equal force to shew the want of vascularity in the bone of the tooth. If it be broken off, it is never regenerated; if it be filed away, it is never reproduced. The same facts hold good of the bone of the tooth, and should lead us to the same conclusion.

There is another effect of injury on the teeth, equally conclusive with the former, as to the non-existence of vessels in their substance. A violent blow will cause a general discolouration of a tooth, as if from a general effusion of

blood throughout its texture. This effect never goes off. There are two ways of accounting for the appearance. 1. By supposing vessels to exist throughout the substance of the tooth, which pour out the blood in consequence of the injury; or, 2dly, by supposing that the vessel in the fang is ruptured, and that the effused blood mechanically discolours the substance of the tooth. If we adopt the former explanation, the colour ought not to be permanent; for, wherever there are arteries, there must also be absorbents; and these absorbents ought to remove the effused blood as they do in bruises of the soft parts. By the latter explanation, we gain a satisfactory solution of the difficulty; we account for the duration of the colour in the same manner as of that which arises from feeding an animal with madder.

The teeth are exempted from all those diseases which ravage the other bony structures of the body. Lues venerea, ferotula, and rickets, which attack all other bones, never produce the slightest effect on these organs, which remain unaltered, even in cases of mollities ossium, where all the other earthy matter of the system is absorbed. In short, the teeth never become constitutionally diseased, nor do they appear, in any instance, to participate in the least in general affections of the frame.

Their substance never swells from inflammation; it never throws out a fungus nor exostosis; it never exfoliates. By the latter expression, I mean, that a part of a tooth never undergoes that process of death, and subsequent separation from the living parts, which we call exfoliation in bones. Whole teeth are sometimes included in an exfoliated portion of the jaw; but then they are not at all altered in structure or appearance, which is another proof of their want of connection with the rest of the body. If it be said that these teeth are dead, like the bone which incloses them, I would wish to be informed, what are the distinctions in appearance between a dead and a living tooth? Are they to be ascertained by external inspection in the living body, or can they be even demonstrated by anatomical investigation? The absorption of the fangs of the temporary teeth cuts off the vessels long before these teeth are actually shed: yet there is no sign or character by which a tooth, whose vascular supply is thus intercepted, can be distinguished from another, in which it remains unimpaired.

A consideration of the mode of formation of the teeth will lead us to the same conclusion, as the arguments already adduced so clearly and irrefragably establish. In this view of the subject, we must inevitably be struck with the great difference between the growth of the teeth, and that of all other bones; a circumstance which would naturally lead us to expect the differences which are found in their structure and economy. In the cartilaginous epiphysis of a young bone, vessels are seen entering from all sides: in the centre there is a small bit of bone of a loose and spongy texture, which can be made quite red by injection. We can trace this hardening through every intermediate stage to that of perfect bone, the vessels of which, even in its most compact state, are still easily demonstrable by the anatomist. Let us compare with this the growth of a tooth. If we examine it at ever so early a period, when a speck of ossification only can be discerned, the part, which is then formed, is complete, and has all the properties which belong to the bone of the perfect tooth. It does not undergo that gradual process of development, which is seen in the growth of bones; but the smallest point, when once formed, never alters. The mode of connection of the tooth to its pulp is highly worthy of consideration. In cartilaginous epiphyses, the central portion of bone is imbedded in the

cartilage: vessels can be traced in numbers entering it on all sides. Observe the contrast in the tooth: the ossification does not go on in the centre of the pulp; but the bone of the tooth covers that part exteriorly like a shell. The connection between them is merely that of contact of surface; there is no discoverable vascular union: a small degree of force suffices to separate them, and the surface of each remains smooth and uninjured.

The arguments and illustrations which we have now offered, tend most strongly to shew, that the teeth possess no vessels in their substance: the point is undeniably proved by the result of anatomical injections, and the effect of feeding animals with madder.

Anatomists have not hitherto succeeded in their attempts to inject coloured fluids into the vessels of the teeth after death. The pulpy substance in the cavity of the tooth may be made red by the injection; but no trace of vessels entering the bone can be discovered. Yet the arteries of other bones, even of such as possess the most compact structure, can be readily demonstrated. No vessel can be shewn in a tooth at any period of its growth; although the proportion of animal matter in the bone of the tooth is not less than what we find in any other bone. To us this argument appears most strong and convincing; but it has sometimes been evaded by stating, that there are other parts in the body possessing no demonstrable vessels, which are yet proved, by various phenomena, to be vascular. Without entering particularly into the general question, we may just observe, that an example, to carry any weight with it, should be adduced from parts of a similar structure; some bone for instance.

The effects produced on the teeth, by feeding animals with madder, tend most directly to prove that these parts possess no vessels. We shall present the reader with the results of Mr. Hunter's experiments in his own words:

"Take a young animal, viz. a pig, and feed it with madder for three or four weeks: then kill the animal, and you will find, upon examination, the following appearances: First, if this animal had some parts of its teeth formed before the feeding with madder, these parts will be known by their remaining of their natural colour; but such parts of the teeth as were formed while the animal was taking the madder, will be found to be of a red colour. This is different from what happens in all other bones; for we know that any part of a bone, which is already formed, is capable of being dyed with madder, though not so fast as the part which is forming. Therefore, as we know that all other bones, by being vascular, are susceptible of the dye, we may conclude that the teeth are not vascular, because they are not susceptible of it when once formed." It is further stated, that the dye communicated to a growing tooth by means of madder is never afterwards discharged, although all other bones lose their colour in time. Nat. History of the Human Teeth, 2d. edit. p. 37 and 38.

The arguments advanced by persons who hold a contrary opinion, who consider the teeth to possess vessels and nerves, and to be endowed with vitality, are so weak and indirect, in comparison with those which are to be urged against these positions; that we should, perhaps, stand excused, if we entirely omitted to notice them. Yet, as the subject is interesting, and as we wish to exhibit a complete view of the question, we shall bestow a few words on their refutation.

It is said, that a part containing so much animal matter as the teeth, could not exist in the temperature of animal body, without undergoing chemical changes. This is merely begging the question. If it can be shewn, by
incon-

incontrovertible arguments, that these organs are destitute of all circulation and living principle, that will prove that they can exist in such a temperature without experiencing these alterations. But the futility of the objection is shown by the circumstance of artificial teeth remaining in this situation unaltered.

The fangs of the tooth are said to become united to each other by ankylosis, and to be deformed by depositions of bony matter like exostoses; also to become transparent and horny in old age.

These are all instances of original formation. They exhibit none of those irregularities on the surface which characterize an ankylosis, or exostosis, in other bones; nor is the substance different in any one point from the healthy part of the fang. It is, in short, merely an accidental difference of form; where, as the offices of the part require no definite figure, variations in form occur daily. The transparency, or horny appearance of the fang, belongs so decidedly to the natural structure, that a *substantia cornea* is enumerated by Blumenbach among the ordinary constituent substances of the teeth.

A question has been triumphantly stated to the opponents of the vascularity of the teeth; why blood is sent into the cavity of the tooth, except for purposes of growth and action? There is one very obvious end answered by this structure; that of filling up the cavity of the tooth, in proportion as it becomes exposed by the friction of mastication. This indeed only shifts the difficulty a step further; for why should there be any cavity at all? We will give an answer to this question, when we shall have been satisfactorily informed why male animals possess mammae and nipples, which are never of the least use to them in any part of their lives: or why a thousand other parts of the body, where we are either ignorant of the office, or can discover no connection between it, and any specific form or organization, should be framed as they are.

The yellow colour imparted to the bone of the teeth in jaundice has been urged in proof of their vascularity. This is an argument that would prove too much. The vessels of the teeth, if any such exist, are obviously so minute, that they neither convey red blood, nor coloured injection; yet they are capable of carrying so much bile as to tinge the tooth of an uniform yellow to a certain distance from the cavity. If this colour be then owing to a yellow fluid, contained in vessels, these tubes must be so numerous as to render the tooth much more vascular than other bone. The real state of the fact is this, the vessels of the pulp become loaded with bile, and dye that part of an uniform yellow colour; this tint is mechanically imparted to the adjacent bone, and colours it in the neighbourhood of the cavity; the effect gradually ceasing at a little distance from that part. The appearance, in short, is produced in the same way as by immersing the teeth in bile after death. We are informed that the teeth in old age become changed in colour, and particularly that they acquire a greater transparency. No one pretends to affirm, that such a change cannot happen; but why may not this change be produced by mechanical or chemical means? Have we not reason to expect that a long residence in the moisture of the mouth, and contact with all the substances that form our food, should influence the appearance of these organs; and that this effect should be produced to a greater extent, where the destruction of the enamel by mastication, as in old persons, has exposed the bone of the tooth?

Transplanting the teeth from the head of one person to that of another, or to parts of another animal's body, as the comb of a cock, where they will become adherent, has

been considered as a proof of their possessing vessels. These experiments will succeed with dead teeth; and the truth of this fact, in respect to the latter circumstance, has been ascertained by Mr. Moor, whose ingenious experiments on the teeth we have before had occasion to mention. We have seen a cock, in whose comb he had inserted a tooth, which had previously lain many months in a drawer, and it was firmly adherent.

The advocates for the vascularity of the teeth have laid great stress on the phenomena attending the decay of these organs; and particularly on the pain, which is occasioned in some parts of the process. We are firmly convinced that an attentive investigation of the origin, progress, and symptoms of this affection will most materially support and illustrate those opinions, which we have all along endeavoured to inculcate.

This disease begins by a speck on the surface of the enamel, and, when it has destroyed that part, it attacks the bone of the tooth. Its progress is now much more rapid: the bone becomes excavated, and the enamel remains in the form of a shell. The surface assumes more or less of a brown colour, and becomes considerably softened, gradually crumbling away until the cavity of the tooth is exposed. The exposure of the vascular and sensible pulp to the air and to the food, occasions that acute pain which attends the decay in this stage.

It would perhaps be difficult to ascertain, beyond the possibility of a doubt, whether or not the pain of toothache ever comes on before the exposure of the cavity. This, at least, is certain, that if the affirmative were most clearly established, it would by no means prove the teeth to be vascular. If we take any very warm or cold fluid into the mouth, it occasions pain of the teeth; this cannot prove the surface of contact to be sensible, for that is enamel, which no one supposes to possess nerves or vessels. The impression is communicated through the substance of the tooth to the nerves in its cavity. When the enamel and a part of the bone is removed by decay, there is so much of the medium between the impressing body and the nerve taken away, that an impression which before only excited a slight sensation, may now cause actual pain. The influence, which variations in the insensible medium between the nerves and external bodies produce on the sensation arising from their contact, is strikingly evinced in the skin; the removal of the cuticle occasions pain to follow the contact of any body, instead of its conveying to our minds impressions of its tangible properties; and a thickened state of this integument entirely obstructs sensation. It is moreover certain that the effect of the decay is not limited to the surface of the tooth, but that the discolouration extends for some depth into its substance; the change, which is indicated by this alteration of colour, may bring on a painful affection of the nerve of the tooth, without an exposure of the cavity.

The following reasons shew that this decay is not the effect of vascular action. It first attacks the enamel, which is confessedly not vascular. There is no attempt at reparation during the whole process; so that if it be, as some persons call it, an ulcer, it must, we presume, be of a cancerous nature. If any doubt could remain on the subject, it will be removed by the fact, that artificial teeth are as much subject to decay as natural ones. The appearance and progress of the caries is exactly the same as in teeth naturally contained in the jaws. The discolouration appears to me to be more deep and extensive in the artificial teeth formed of the tooth of the hippopotamus, than in the natural human teeth. But in engrafted human teeth the decay is precisely similar to that of the natural ones.

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The alleviation of the pain of the tooth-ache by caustic applications to the surface, as muriatic acids or argertum nitratum, has been considered as a proof that the caries is an ulcer in an irritable state, and that its irritability is destroyed by these applications. Since however these remedies may act upon the exposed vascular contents of the cavity of the tooth, or may affect these contents, before actual exposure, by penetrating through the thin medium which remains, it is obvious that they can afford no proof of the point in question. Other means however of stopping the pain of tooth-ache afford a strong proof that the pain does not arise from the ulcerated surface, but from the nerves in the cavity. Let the decayed hole be stopped up (which is rather a rude method of using an irritable ulcer), so as to cut off the access of the external air, and of foreign bodies, and the pain will cease.

It is not perhaps so easy to determine what the decay is, as what it is not. Those who consider the teeth as destitute of vessels, ascribe their decay to the chemical action of the juices of the mouth, and of the substances which are taken in for food. It is difficult to comprehend how a cause, which must necessarily be so general in its application, should be so circumscribed in its effects: never producing decay in an extent of surface, but being limited at its commencement to a small spot. Here however it may be observed, that a large surface sometimes decays in artificial teeth, under circumstances favouring an accumulation of fluids in a particular part; *viz.* the portion which corresponds to the gum, which is usually grooved; and thereby more likely to retain any fluids.

Many arguments may be adduced to prove, that the decay of the teeth originates from the causes above-mentioned. It commences in those situations, which favour the lodgement of food or extraneous matters; as between the teeth, and near the neck, just where the gum adheres. It is cured by stopping up the hole, and preventing the introduction and accumulation of the food, and the juices of the mouth. It is most frequent in the higher classes of society, where the food is of the most unnatural kind, and the appetite is pampered with all the refinements of cookery; and is much less common in the peasantry, which take more simple food, and employ it in a more natural form. It is very rare to see it in the teeth of savages, or such persons as have lived nearly in a state of nature; and it never, we believe, occurs in animals. In twelve or fourteen crania, discovered in two barrows opened in Gloucestershire, there was not a single decayed tooth. This mode of burial has not been employed for the last six centuries, so that the heads in question must be referred to a remote period of history, to a time when the modern habits of luxury and indulgence, in respect to food, were unknown, and where the effects of such habits on the teeth were of course not discernible.

A similar observation is made by Sir John Sinclair, in his "Code of Health and Longevity," vol. i. p. 69, respecting the state of the teeth in the crania, found on opening a place of interment at Scone, near Perth in Scotland. This had not been touched for two hundred years; and among a great number of skeletons there was hardly one, whose teeth were not entire and found. This fact leads the worthy baronet to suppose that our ancestors enjoyed advantages over us in the structure of their teeth; but our explanation of the appearance will be collected from the remarks made above. The practice of smoking, which is universally prevalent in some countries on the continent, is attended with a most marked deleterious effect on the state of the teeth; inasmuch that the discoloured and unsound state of these organs,

in inhabitants of such countries, attracts the notice of every traveller.

As all the attempts to prove the vascularity of the human teeth by direct arguments, drawn from the structure and diseases of these organs, have so completely failed, recourse has been had to comparative anatomy; and the constant growth of the teeth of glires, and the appearances caused by the presence of bullets in elephant's tusks, have been brought forwards in support of their opinions by the partisans of the vascularity of the teeth.

Animals of the class glires of Linnæus, such as the beaver, hare, rabbit, squirrel, rat, mouse, &c. are distinguished by possessing two very large incisor teeth in each jaw, which being employed by the animal in cutting various hard bodies, wear down very rapidly. Hence if these animals be kept to soft food, their teeth grow out to a great length; and if these teeth be lost from one jaw, the opposite ones grow out in the same way. This constant growth of these organs is effected in the same manner as their original formation. They are hollow internally, and contain a pulp, which continues to deposit fresh substance below, in proportion as the tooth wears away above. The tusks of the elephant possess the same constant growth, as also those of the hippopotamus, and all similar organs.

When an elephant's tusk has been shot with a leaden bullet, it is said, that the opening, through which the ball entered, is filled up again by the vessels of the tooth. The bullet is closely surrounded by the ivory, and there is a swelling towards the cavity of the tooth opposite to the situation of the foreign body, ascribed to the inflammation caused by its irritation.

It may be observed in the first place, that the appearances exhibited by the teeth in question, are by no means what we should reasonably expect in such a case. When a bullet has entered the substance of the body, the surrounding lacerated and confused parts do not grow to the metal and become firmly attached to its surface, but they inflame and suppurate, in order to get rid of the offending matter. If the ivory be vascular and sensible, why do not the same processes take place in it?

We can explain very satisfactorily how a bullet may enter the tusk of an elephant, and become imbedded in the ivory without any opening for its admission being perceptible. We have already mentioned, that these tusks are constantly growing during the animal's life, by a deposition of successive laminae within the cavity, while the outer surface and the point are gradually worn away; and that the cavity is filled for this purpose with a vascular pulp, similar to that on which the teeth are originally formed. If a ball penetrate the side of a tusk, cross its cavity, and lodge in the slightest way on the opposite side, it will become covered towards the cavity by the newly deposited layers of ivory, while no opening will exist between it and the surface, to account for its entrance. If it have only sufficient force just to enter, it may sink by its own weight between the pulp and tooth, until it rests at the bottom of the cavity. It there becomes surrounded by new layers of ivory, and as the tusk is gradually worn away, and supplied by new depositions, it will soon be found in the centre of the solid part of the tooth. Lastly, a foreign body may enter the tusk from above, as the plate of bone which forms its socket is thin: if this descends to the lower part of the cavity, it may become imbedded by the subsequent formations of ivory. This must have happened in a case where a spear head was found in an elephant's tusk. The long axis of the foreign body corresponded to that of the cavity. No opening for its admission could be discovered, and it is clear that no hu-

man strength could drive such a body through the side of a tusk. See Philof. Transact. 1801. part 1.

Having now enumerated the reasons which prove that the substance of the teeth is destitute of vessels and nerves, and having briefly answered some objections which may be made to that opinion, we shall terminate the present division of the article by putting one question to the supporters of a contrary doctrine. Of what use could vessels and nerves be in a part like the tooth, which undergoes no natural change except the mechanical one of abrasion of surface, which is subject to no disease except one, that is referable to chemical action; which sets up no process of regeneration to repair the effects of either of these changes, or the consequences of accidental injury, and which in every known state is totally destitute in itself of all sensation? We desire to know what end could be answered by making these parts vascular and sensible?

The following are the most useful works on the teeth, and contain representations of most parts of their structure and anatomy. Eullachii "Libellus de Dentibus." Albini "Annotationum Academicarum," lib. ii. J. Hunter's "Natural History of the Human Teeth." Girardi "Oratio de Re Anatomicâ." Parma, 1781, 8vo. Blake's "Essay on the Structure and Formation of the Teeth in Man and various Animals." Dublin, 8vo. 1801. Fox's "Natural History of the Human Teeth." Soemmering, *de dentibus*, in the first vol. of his "Anatomy."

In the description which we have thus given of the individual bones of the cranium and face, all the particulars relating to their structure and formation are detailed. It remains for us to view the skull as forming one whole, which is indeed the proper way of considering it, as the connection of the various bones, by means of sutures, is so firm, that the adult cranium may be considered as consisting of a single piece of bone. Hence it becomes necessary to describe the form of the cranium and face in a general way.

Many of the cavities and depressions in the skull and face, which are formed of processes of several bones, would not be at all understood by reading the descriptions of the individual bones. These, therefore, must be described as they exist in the entire cranium, in order to give the reader a notion of their form, extent, &c. Hence we shall add to the account of the form of the cranium and face, a description of the *calvaria* (skull cap), *basis cranii*, *temporal fossa*, *orbit*, and *nose*, and a general enumeration of the openings on the surface of the skull. This will be followed by a description of the *national differences in the form of the skull*, and the article will be concluded by an enumeration of the characters of the human head; by an account of those points of structure which distinguish the cranium of man from that of other animals.

Form of the Cranium and Face.

The external surface of the cranium, considered on its anterior, superior, and posterior parts, is pretty regularly elliptical; the narrower part of the ellipse being placed in front, and the broader part behind. The radius of the anterior part is to that of the posterior as three to four, or two to three, in the infant; as thirty to thirty-one in the adult. The largest horizontal circumference of the cranium presents likewise an oval figure, and is narrow or contracted in front, broader behind. The anterior, posterior, and upper parts of the bony arch are uniformly convex on their surface; but the sides of the cranium are rather flattened by the temporal muscles. These, however, are convex like the rest of the surface in infants.

The greatest diameter of the cranium is from the os fron-

tis to the occiput, and measures six inches and a half; the greatest *transverse* diameter is five inches and a half; and the greatest *perpendicular* (*viz.* from the middle of the foramen magnum to the vertex) five inches.

A longitudinal section of the cranium, in the direction from before backwards, would form an oval rather contracted in front, if its curve were continued from the occipital foramen to the root of the nose. The great axis of the oval would be nearly parallel to the floor of the nostrils, or at least it would slope backwards very slightly. The ratio of the great to the small axis would be as five to four. But the space included between the two points above-mentioned, which form the boundary of the cranium and face, instead of presenting a curved line, forms an irregular projection within the cavity of the oval. The section of the face forms, therefore, a triangle, the longest side of which is that which touches the cranium, and the shortest is the anterior one.

The external surface of the cranium, on its upper and back part and sides, is generally smooth and uniform, with the exception of the slight inequalities noticed in the frontal, parietal, and occipital bones. It is also solid or imperforate, with the exception of a few small apertures. The basis on the contrary is very irregular and broken in its surface, and pierced by numerous apertures, which transmit arteries to the interior of the cranium, give exit to the corresponding veins, and allow passage to the various nerves originating from the brain. On either side of its anterior part it is excavated to contribute to the formation of the orbits. Between these two hollows it descends towards the cavity of the nose, and behind the palate. A prominence on either side assists in forming the zygomatic arch; the malleoid processes form large protuberances behind, and the articular condyles of the occiput smaller ones near the centre of the basis.

Description of the Calvaria, or Skull-cap.

An horizontal section of the cranium, at whatever part, represents an ovate figure, of which the small end is placed anteriorly and the larger posteriorly.

The bony arch which forms the upper part of the head, consists of the greatest part of the frontal and parietal bones, with a small share of the occipital. Its internal surface is nearly smooth. It only presents the impressions made by the vessels and glandulæ pæchioni of the dura mater, or by the convolutions of the brain. A broad, but superficial groove runs along the middle of the bony vault in its whole extent; it holds the superior longitudinal sinus of the dura mater. The pits of the glandulæ pæchioni are found in considerable number, but of various sizes and depths, on either side of this groove. Frequently the bone is so thin in these pits that it appears transparent when held against the light.

Basis Cranii.

The basis or floor of the cranium is very unequal on its surface, and presents considerable prominences and depressions, adapted to the various parts of the basis of the encephalon. It may be divided into *three regions*, of which the anterior exhibits a convex surface, while the two posterior are considerable depressions or fossæ.

The *posterior region*, which is chiefly occupied by the cerebellum, may be named fossa cerebelli. It is the deepest of the three, and has been called the lower occipital fossa.

The great occipital foramen is formed in the middle and lower part of this division. From the front of this opening a slight excavation extends obliquely upwards and forwards,

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and is terminated anteriorly by a thin projecting bony plate, the two corners of which form the *posterior orbital processes*. The ethmoid lamina, which forms the boundary of this excavation, belongs to the sphenoid bone; the concavity itself is chiefly formed by the basilar process of the occiput, and may be called the *basilar fossa*. The medulla oblongata rests in it, and sends from its lower or posterior part the medulla spinalis through the foramen magnum.

From each posterior ethmoid process, a sharp ridge is continued obliquely backwards and outwards, and marks the termination of the fossa cerebelli in this direction. To this part, which belongs to the petrous portion of the temporal bone, the tentorium cerebelli is affixed. The posterior boundary of this fossa is formed by the internal transverse ridge of the occiput; from the middle of which a longitudinal spine descends to the foramen magnum, so as to divide the fossa cerebelli into equal portions; in which the two lobes of the cerebellum are contained.

The *anterior region*, which supports the front lobes of the cerebrum, is formed by the roof of the orbits and nose. It is not separated, by any mark of distinction, from the calvaria. Its posterior boundary is the sharp concave edges of the lesser sphenoid alæ. These terminate towards the inner and back part by two rounded projections (*anterior ethmoid processes*;) situated nearly opposite the posterior ethmoid processes. A slight prominence of the bone between these projecting points completes its posterior boundary. The middle of this region is the deepest part; it is the cribriform lamella of the ethmoid bone, having the crista galli standing up from its middle, and dividing the two anterior lobes of the cerebrum. The sides, which are formed by the roofs of the orbits, are convex and irregular on their surface, from the prominences which rise between the convolutions of the brain.

The *middle region* consists of a large fossæ on either side of the skull, formed by the upper surface of the great sphenoid ala, and of the petrous bone. The boundaries of the anterior and middle regions will of course form the limits of these middle fossæ of the cranium. The surface of this division occupies the intermediate degree between the level of the anterior and posterior regions. As these latter extend considerably farther in the middle of the cranium than at the sides, they nearly meet together in the centre, where they are only separated by the *fella turcica*; which cavity belongs to the middle region, although it is more elevated than the fossæ, which lie on either side of it.

These middle fossæ of the basis cranii hold the anterior convex portions of the posterior lobes of the cerebrum (the middle lobes of some writers.)

The Temporal Fossa.

The flat surface which is observable towards the anterior part at the side of the cranium affords attachment to the temporal, or erotaphyte muscle. A white and somewhat prominent line commences behind the outer edge of the orbit, and runs upwards and backwards over the frontal and parietal bones, so as to describe a semicircle on the side of the skull. From the termination of the parietal bone it turns forwards over the os temporis to the root of the zygoma. This line, the superior edge of the zygoma, and the posterior margin of the os malæ have the strong temporal fascia attached to their surface. The side of the skull with in the line, which is obviously compressed or flattened, including a small portion of the os frontis, a very large share of the parietal bone, the whole squamous portion of the temporal bone, a considerable surface of the sphenoid ala, and of the os malæ, gives origin to the fibres of the

muscle. The internal orbital process of the cheek-bone separates this fossa from the orbit; and the zygoma is a bony arch at the lower part, where it is deepest, within which the tendon passes.

The surface of the temporal fossa is much more extensive, and the depression is more strongly marked, in the negro than in the European.

Cavity of the Orbit.

Those deep bony cavities of the face, called the *orbits*, which hold the organs of vision, are separated from each other by the nose; and are situated under the front of the cranium. They represent in form four-sided pyramids, of which the angles are rounded off; the basis is placed towards the front, and the apex backwards. The margin or front entrance of the cavity has the same square form with rounded angles; and hence it consists of a superior, inferior, external, and internal margin; the junction of which to each other, forms the frontal, temporal, malar, and lacrymal angles. The orbit has also four surfaces; a superior, which extends nearly in the horizontal direction, and is concave; an inferior, which slopes very slightly backwards and upwards; an internal gently convex; and an external which is level. They are all very smooth.

The internal surfaces of the two orbits are parallel to each other; while the outer surfaces are situated very obliquely, passing from before backwards and inwards. Hence the axes of the two cavities would join at an angle in the *fella turcica*. In consequence of this construction the eyes command a wider field of vision than they would if the axes were parallel to each other.

Seven bones contribute to form this cavity: the upper surface is formed by the os frontis only; the inner by the os unguis and os planum; the inferior by the superior maxilla, os malæ, and palati; the outer by the os malæ, and sphenoid bone.

The form of the cavity is subject to considerable variety.

It is only in comparatively modern times that the orbits have been described in their true connection and relations. Besides the few remarks which Winslow has made on the subject in the "Memoires de l'Acad. des Sciences de Paris," 1721; much information may be derived from the 1st chap. of Camper's "Diff. Physiol. de quibusdam oculi partibus. L. B." 1746; and from the 7th chap. of Zinn's immortal work "Descript. Anat. oculi humani." Götting. 4to. 1755.

Cavities of the Nose.

The bony hollows, on which the olfactory membrane is expanded, are placed between the orbits and below them. Fourteen bones contribute to their formation; viz. all the bones of the upper jaw, excepting the ossa malæ, the ethmoid, sphenoid, and frontal bones.

The extent of the cavity from its commencement in front to its termination at the back of the palate, is not very considerable: but it is greatly increased by the numerous cells of the cranium and face, which open into it at different parts. A broad perpendicular septum divides it into a right and left cavity; but this division is generally an unequal one, as the bony partition commonly inclines to one side or the other.

The *septum narium* is formed by the nasal lamella of the ethmoid bone, and the vomer. The *entrance* of the nose is constituted by the ossa nasi and superior maxillæ; and, as far as the bony compages is concerned, consists of a single heart-shaped aperture, common to both nostrils. The upper and anterior part of this opening possesses a sharp edge; and

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and there is a curved spinous process projecting from its middle and lower part.

The termination of the nasal cavity, or its *posterior opening* (*choana*.) instead of being common to both nostrils, consists of two apertures; one for each side. They are formed by the internal pterygoid plates of the sphenoid bone, the *ossa palati* and vomer. Their figure is somewhat oval, and the length exceeds the breadth.

The *bottom* or floor of the nose, which is concave, is formed by the superior maxillæ and *ossa palati*. The *inner surface* of each nostril is smooth, uniform, and perpendicular, as being formed by the septum narium. The outer surface is very irregular, chiefly from the projection of the three conchæ or turbinated bones, which hang into the cavity.

By these projecting conchæ three cavities are formed in the nostril, called the *canales* or *meatus narium*. The *inferior* is the largest, and is included between the floor of the nostril, and the inferior turbinated bone. The *middle* is the space left between the last mentioned part, and the middle concha; and the *superior*, which is the smallest, is between the middle and superior conchæ. The last of these does not open anteriorly; but the two former communicate with the nostrils in front as well as behind.

The superior surface or roof of the nose is the least extensive of all; and is formed by the cribriform plate of the ethmoid bone only.

The ethmoidal and sphenoidal cells open into the superior meatus: the frontal and maxillary sinuses terminate in the middle; and the nasal duct ends in the lower meatus.

Casserius furnished the first accurate description and delineation of the cavities of the nose, in the human subject, and in different animals, ("De Fabrica nasi," in his "Pentæthescion," p. 115. et seq. 1610.) Among modern writers on this subject, Aurivillius deserves particular mention, ("Diff. de naribus internis," Upsal. 1760.) The reader may consult likewise Duverney's "Œuvres Anat." vol. i. tab. 14. Haller's "Tab. narium internar." in the 4th Fascic. of his "Icones." Santorini's "Tab. posthum." editæ à Girardo. tab. 4. Blumenbach's "Prolusio Anatom. de Sinibus Frontalibus."

General Enumeration of the Foramina, Fissures, Canals, &c. in the entire Cranium.

I. On the external surface.

- a. On the *vertex*, or upper part of the head.
 1. *Foramina parietalia* for a small artery and vein.
- b. In the *orbit*.
 2. *F. s. supraorbitalia* for the frontal nerves and arteries.
 3. *F. s. infraorbitalia*; the openings of the infraorbital canals for the arteries and nerves of the same name.
 4. Superior openings of the lacrymal canals.
 - 5, 6. *F. orbitalia interna* for the nasal branches of the ophthalmic nerves, and the ethmoidal arteries.
 7. *F. optica* for the optic nerves and ocular arteries.
 8. *Fissura orbitalis superior* (*foramen lacerum orbitale*) for the 3d, 4th, and 6th pairs of nerves, the ophthalmic branch of the 5th pair, and the ocular veins.
 9. *Fissura sphenopalatina*, at which the 2d branch of the 5th pair divides.
 10. *Inferior orbital*, or *spheno-maxillary fissure* for the passage of the infraorbital nerve.
- c. In the *palate*.
 11. *Foramen incisivum*, or *palatinum anterius*.
 12. *Foramen palatinum posterius* for the palatine artery and nerve.

- 13, 14. Two smaller palatine holes for more minute twigs of nerve or artery.
- d. In the *ear*.
 15. *Meatus auditorius externus*.
 16. *Fissura glaseri* for the chorda tympani, and origin of the externus mallei.
- e. In the *basis cranii*
 17. *Foramen sphenomastoideum* for the facial nerve, and an artery and vein.
 18. *Foramen ovale* for the 3d branch of the 5th pair.
 19. Opening of the *pterygoid canal* for the Vidian nerve.
 20. *Foramen spinosum* for the art. meningea media.
 21. Entrance of the *carotid canal* for the carotid artery, and a branch of the 6th pair of nerves.
 22. *Foramen lacerum in basi cranii* (*f. jugulare*) for the jugular vein and par vagum.
 23. *Foramen condyloideum anterius* for the nervous linguualis medius.
 24. *Foramen condyloideum posterius* for the passage of veins.
 25. *Foramina mastoidea* for the passage of veins.
 26. *Foramen occipitale magnum* for the medulla spinalis, with its coverings; the vertebral arteries; and the nervi accessorii.
- f. In the lower jaw.
 27. *Foramen maxillare posterius* for a branch of the inferior maxillary nerve, and an artery and vein.
 28. *Foramen mentale* for the mental nerve.

II. On the inner Surface of the Skull.

- a. in the *vertex*.

Foramen parietale, mentioned above.
- b. In the *basis cranii*.
 29. *Foramen cæcum* for the attachment of the falx cerebri.
 30. *Foramina laminae cribosæ* for the olfactory nerves, and nasal branch of the ophthalmic nerve.
Foramen opticum, mentioned above.
Fissura orbitalis superior, mentioned above.
 31. *Foramen rotundum* for the 2d branch of the 5th pair.
Foramen ovale, mentioned above.
Foramen spinosum, mentioned above.
 32. *Termination of the carotid canal*
 33. *Foramen on the petrous bone* for a branch of the Vidian nerve.
 34. *Meatus auditorius internus* for the 7th pair of nerves.
 35. Opening of the aquæductus vestibuli.
 36. Opening of the aquæductus cochleæ.
Foramen lacerum in basi cranii, mentioned before.
Foramen condyloideum anterius, mentioned before.
Foramen condyloid. poster. mentioned before.
Foramina mastoidea, mentioned above.
Foramina occipitale magnum, mentioned above.

National varieties in the Form of the Cranium.

It is only of late years that this subject, which offers a most important and interesting field of investigation, has been examined with that attention which it deserves. With the exception of a few desultory observations, which are scattered through the works of different writers, Daubenton's paper, "Sur la difference du grand trou occipital dans l'homme, et dans les autres animaux," in the memoirs of the Royal Academy of Sciences for 1764, contains the first attempt at any general remarks on the subject: and this, indeed, is more important in pointing out the differences between the human structure and that of animals, than in

defining the characters of the cranium in the different races of mankind. Camper has attempted a more systematic account of the national forms of the cranium. (See the 1st. vol. of his "Kleinere Schriften;" his "Naturgeschichte des Ours, et Outang;" and particularly the "Dissertation physique sur les differences reelles que presentent les traits du visage chez les hommes de differens pays et de differens ages," Utrecht, 1794, translated from the original Dutch.) The observations of this illustrious anatomist on the present subject, as on all others which he has treated, are ingenious and interesting; but cannot be considered as even approximating to a systematic account of the national varieties of the skull. He does not appear to have possessed a sufficient collection of crania for this purpose; and the differences which he has pointed out, regarding merely the various degrees of prominence of the jaws, afford very insufficient criteria for determining the numerous points of distinction which characterise the skulls of different nations. We are indebted to the celebrated Blumenbach of Göttingen for the most complete body of information on this subject: which he has been enabled most successfully to illustrate, by means of a collection, containing above a hundred specimens, of the crania of different nations from all parts of the globe. His admirable work, "De generis humani varietate nativâ," contains a short sketch of the various formations of the skull in different nations: but he has treated the matter at greater length, and with more minute detail in an express work, where the various crania are represented of their natural size: the book is entitled, "Decades craniorum diversarum gentium illustratæ," Göttingen, 1790, 1800, 4to. Four decades, containing representations of forty crania, have hitherto arrived in this country. The following account will be chiefly derived from the two last-mentioned books.

It is sufficiently obvious that there must be a close connection between the external parts of the face, or the features, and the bony compages which lie under and support these. So that we might venture to affirm, that a blind man, if he knew the vast difference which exists between the face of a Calmuck and that of a Negro, would be able to distinguish the crania of these two races of mankind by the mere touch. Nor could you persuade any person, however ignorant of the subject, that either of these skulls belonged to a head, similar to those from which the divine examples of the ancient Grecian sculpture were copied. Thus much is clear and undeniable, as to the general habit and appearance of the skull. A more careful anatomical investigation of genuine specimens of the crania of different nations promised to throw still further light on the subject of the varieties of the human race. For, when freed from the soft parts, which are less constant and regular in their formation, they exhibit the firm and solid foundation of the head; they can be conveniently handled and examined; considered in various points of view, and compared with each other.

Such a comparison will shew us, that the form of the cranium differs no less than the colour of the skin, or other characters, in different individuals; and that one kind of structure runs by gentle and almost inobservable gradations into another: yet that there is on the whole an undeniable, nay, a very remarkable, constancy of character in the crania of different nations, contributing very essentially to national peculiarities of form, and corresponding exactly to the features which characterise such nations. Hence, anatomists have attempted to lay down some scale of dimensions to which the various forms of the skull might be referred; and by means of which they might be reduced into certain

classes. Of these endeavours, the *facial line* of Camper seems to claim the most attention.

The cranium, being placed laterally, two imaginary lines are drawn on its surface to intersect each other at a particular point. The first proceeds horizontally through the meatus auditorius externus, and the floor of the nostrils. The other, or the proper *facial line*, is continued from the most prominent portion of the forehead above the nose, to the front of the alveolar margin of the upper jaw-bone. From the angle formed at the junction of those two lines, this excellent anatomist conceived that we might estimate the differences of the cranium in animals, as well as in the various races of mankind. (A further account of the results of its application will be given in the division of this article on the characters which distinguish the human cranium from that of animals.)

This criterion is exposed to some very serious and essential objections. It is sufficiently obvious, that the *facial line* can at most be applicable to such varieties only of the human race as differ from each other in various degrees of prominence of the jaws; and that it will not at all exhibit the characters of those which vary in the opposite way, *viz.* in the greater or less breadth of the face. It often happens that crania of the most different nations, which differ *totò celo* from each other on the whole, have the same facial line; and, on the contrary, that skulls of the same nation, which agree in general character, differ very much in the direction of this line. Thus, in the *decades* of Blumenbach, we have represented the crania of a Negro and of a Pole, which possess exactly the same facial line. Yet the general character of the two skulls is most widely different, when the narrow and almost keel-shaped head of the Ethiopian is compared to the broad square form of the Lithuanian. (*Decas Altera*, tab. 10. *Decas Tertia*, tab. 22.) There are, on the contrary, in the same work two Negro crania of very different facial lines, which, when viewed in front, betray their Ethiopic origin most incontestably, by the same characters of a narrow and compressed cranium and arched forehead. (*Decas Prima*, tab. 7 and 8.) Lastly, Camper himself has employed his two lines, in the plates subjoined to his work, in so arbitrary and inconstant a manner, changing frequently the point of contact, on which their whole utility must depend, that he clearly appears to be hesitating and uncertain in their employment.

Blumenbach states, that in the examination and classification of his immense collection of the crania of different nations, he finds it every day more and more difficult, amidst such numerous differences in the proportion and direction of various parts, all of which contribute more or less to the national character, to reduce these to the measurements or angles of any single scale. Since, however, in distinguishing the characters of different crania, such a view will gain the preference to all others, as offers at one glance the most numerous and important points, and such as contribute especially to the comparison of national characteristics, he has found by experience that to be the best adapted to this purpose, which is obtained by placing the different crania (including the lower jaws), with the zygomas, in the same perpendicular line, on a table in a row, and contemplating them from behind. When crania are thus arranged, those circumstances which contribute most to the formation of the national character, the direction of the jaws and cheek-bones, the breadth or narrowness of the head, the arched or flat form of the forehead, are all distinctly perceived at one view. This method of considering the cranium is called by Blumenbach *norma verticalis*. It is exhibited in the three first figures of the second plate of the anatomy of the cranium,

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nium, where three heads are represented in this point of view, in order to illustrate the subject. The middle of the three (*fig. 1.*), distinguished by the symmetry and beauty of all its parts, is that of a Georgian female; the two outer ones are examples of heads differing from this in the opposite extremes. That which is elongated in front (*fig. 2.*) is the head of a Negress, from the coast of Guinea; the other, which is expanded laterally, and flattened in front (*fig. 3.*), is the cranium of a Tungoose, from the north-east of Asia. The margin of the orbits and the zygoma are elegantly contrasted in the Georgian; and the jaws are hidden by the symmetrical expansion of the forehead. In the Ethiopian, the maxillary bones, and indeed the whole face, are compressed laterally, and project in front. In the Tungoose, on the contrary, the ossa maxæ, ossa nasi, and glabella, are situated on the same horizontal level, and are enormously expanded on either side.

The national varieties in the form of the cranium may be considered in the five chief divisions, under which the different nations of mankind have been distributed by Blumenbach. The first of these comprehends the inhabitants of Europe; together with the western Asiatics, or those which are found on this side of the Caspian sea, and the rivers Ob and Ganges; and the northern Africans: in a word, the inhabitants of the world as known to the ancients. In this, which Blumenbach calls the *Caucasian* variety of the human race, the form of the cranium is somewhat globular; the forehead moderately expanded; the cheek-bones narrow, and not prominent, but descending in a straight line from the external angular process of the os frontis. The alveolar margin of the jaws is rounded; the front teeth are placed perpendicularly in both jaws. The angle formed by the facial line is 80 degrees.

As a specimen of this variety, we have selected from the third decade of Blumenbach's work the cranium of a Georgian woman; which, on account of the exact symmetry and beauty of its formation, may be regarded as the model of a perfect head. (*Anatomy of the Cranium. Plate I. fig. 1.*) The form of this head is of such distinguished elegance, that it attracts the attention of all who visit the collection in which it is contained. We present the reader with the description of this cranium, in the words of Blumenbach. "Calvaria subglobosa, versus tempora paulo compressior; frons modicè explanata; ossa jugalia angustiora, inde a processu malari ossis frontis leniter utrinque descendunt et retrorsum flexa; arcus superciliares æquabiles nullo ad glabellam interstinio distincti, sed eo loco molli potius tubere cum nasi dorso confluentes; limbus alveolaris æquabiliter arcuatus; mentum pleniuseculum, pulchrè rotundatum; verb, in universo capitis hujus ossi ambitu nihil asperi, nihil præter modum profilientis, ita ut perfectè medium teneat locum inter hinc faciei gentilitæ in humano genere extrema; Mongolicum nempe alterum, facie complanata et quasi repressâ, ac ossium jugalium extrorsum utrinque directâ eminentia insigni; alterum Æthiopicum, fronte contra tuberoso et fornicato, ac mandibulis angustis sed antrosum porrectis, conspicuum."

The symmetry and beauty of this Georgian head are further evinced by comparing it with the proportions observed in the invaluable remains of the ancient Grecian sculpture. It corresponds exactly with the marble statue of a nymph, in the collection of the late Mr. Townley, of which Blumenbach possessed a plaster cast. It tends also to confirm the testimony of the numerous travellers who have unanimously concurred in extolling the beauty of the inhabitants of Georgia, and the neighbouring countries. The expressions of Chardin are so warm and animated on this sub-

ject, that the reader will not be displeased by seeing the original passage. "Le sang de Géorgie est le plus beau de l'orient, et je puis dire du monde. Je n'ai pas remarqué un visage laid en ce pays là, parmi l'un et l'autre sexe; mais j'y en ai vu d'angeliques. La nature y a répandu sur la plupart des femmes, des graces qu'on ne voit point ailleurs. Je tiens pour impossible, de les regarder sans les aimer. L'on ne peut peindre de plus charmans visages, ni de plus belles tailles, que celles des Géorgiennes." (Vol. i. p. 171. Ed. of 1735.)

Another specimen of this variety (the cranium of a Turk) has been inserted in the first plate of the anatomy of the cranium, on account of a singularity in its form, arising probably from artificial causes. (*Anatomy of the Cranium, Plate I. fig. 2.*) The cranium is here completely globular. The occiput can hardly be said to exist, as the foramen magnum is placed nearly at the posterior part of the basis cranii. The forehead is broad, and the glabella prominent. The proportions of the face are, on the whole, symmetrical and elegant. The alveolar portion of the upper jaw-bone is singularly short; it does not measure more than the breadth of the little finger under the nose.

The cranium of a Turk, in the possession of the writer of this article, exactly resembles the plate of Blumenbach, (*Decas Prima, tab. 2.*) from which the engraving in the present work was copied. It corresponds also with the form of the head, as observable in the living subject, and with the most faithful delineations of such persons. This peculiarity of form has been observed by several authors: it is indeed so striking, that it could hardly have escaped observation. "It appears," says Vesalius, "that most nations have something peculiar in the form of the head. The crania of the Genoese, and still more remarkably those of the Greeks and Turks, are completely globular in their form. This shape, which they esteem as elegant, and adapted to the turbans, which they wear on the head, is produced by the midwives, at the solicitation of the mothers." (*De Corporis humani Fabricâ, p. 23. ed. of 1555.*) This statement is confirmed by a letter from baron Asch to Blumenbach; in which he says, that the midwives at Constantinople commonly inquire of the mother, after parturition, what form she would like to have given to the head of the child; and that they commonly prefer that which results from subjecting the forehead and occiput to a close compression, as they think that their turbans sit better on the head, when of that shape. (*Decas Prima, p. 16.*)

The other nations, included under this first division, do not seem to be distinguished in general by any remarkable peculiarities; although some slight characteristics have been pointed out. The cranium is broad and square, and the face flattened, in the Laplander; so that he approaches in that respect to the Mongolian variety. According to Vesalius (*loco citato*), the Germans are generally conspicuous for the breadth of the head, and flattened form of the occiput; because, says he, the children always lie on their backs. The assigned cause does not appear adequate to the production of the effect; yet, that such a form does belong, in some cases, to the German cranium, is proved by a skull in the possession of the writer of this article, which, in its globular form, in the flattened state of the occiput, and in the approximation of the great occipital foramen to the posterior part of the basis cranii, exactly resembles the Turkish cranium. Soemmering, however, whose authority on this point cannot be disputed, states that there is no well-marked difference between the German, Swiss, French, Swedish, and Russian crania, according to the specimens in his possession; except that the orbits are contracted in the Russian, and their margins

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quadrangular, and the teeth are small. (De Corporis humani Fabricâ, tom. i. p. 63.)

It is well known that the inhabitants of the northern division of our own island are characterized by the height of their cheek-bones.

The second, or *Mongolian variety*, includes those Asiatics, which do not come under the first division, and the inhabitants of the northern parts of America. The head is of a square form; and the cheek-bones stand out widely to either side. The glabella, and ossa nasi, which are flat and very small, are placed nearly in the same horizontal line with the ossa maxilaria. There are scarcely any superciliary ridges: the entrance of the nostrils is narrow; the malar fossa forms but a slight excavation. The alveolar edge of the jaws is obtusely arched in front; the chin rather prominent. This formation is most strikingly exhibited in the Mongolian tribes, which are widely scattered over the continent of Asia, and which have generally, but erroneously, been included with some of very different origin and formation under the name of Tartars; whereas the last-mentioned tribes, properly so called, belong to the first division of the human race. The Calmucks, and other Mongolian nations, which overran the Saracen empire, under Zengis-Khan, about the middle of the thirteenth century, and had entered Europe, are described in the "Historia Major," of Matthew Paris, under the name of *Tartars*, (p. 530, London, 1686, folio); whereas that appellation properly belongs to the western Asiatics, who had been vanquished by the Monguls. The error, however, arising from this source, has been propagated down to the present day, so that in the works of the most approved naturalists, as Buffon and Erxleben, we find the characters of the Mongolian race ascribed to what they call the Tartars. The mistake has not even been detected by the most celebrated and classical modern historians; as Dr. Robertson speaks of Zengis as the emperor of the Tartars ("History of America," vol. i. p. 45.) The reader, who wishes for further information on this subject, may consult J. E. Fischer *conjectura de gente et nomine Tartarorum*, in his "Quæstiones Petropolitanæ," p. 46 *et seq.*

We have selected the cranium of the Calmuck from the third decade of Blumenbach to exemplify this variety. (*Anatomy of the Cranium*, Pl. 1. fig. 4.) The whole formation and proportions of this cranium correspond exactly to the well known Calmuck physiognomy; and the representation perfectly resembles that of the skull delineated by Fischer ("Diff. de modo, quo ossa se vicinis accommodant partibus," Lugd. Bat. 1743, 4to. tab. 1.) The strong characters, which are so clearly exhibited in this cranium, are altogether different from those of the head, which Camper has exhibited for that of a Calmuck, in his work on the facial line. The last-mentioned engraving represents a head, in which the negro character, the very opposite extreme to that of the Calmuck, is so unequivocally exhibited, that we cannot doubt that the drawing was taken from an African head. The work of Camper contains therefore, besides European skulls, only two African ones; it must consequently be completely inadequate to give any correct systematic account of the subject.

The third, or *Ethiopian variety*, includes the Africans, which do not come within the first division. The cranium is narrow, being compressed at the sides, where the temporal fossa is of immense extent. The forehead strongly arched; the cheek-bones project anteriorly; the nostrils are large; the malar fossa is considerable and deep. The alveolar edges of both jaws stand very much forwards; they

are narrow, elongated, and of an elliptical figure. The front teeth of the upper jaw are oblique in their position. The lower jaw is large and strong; but the chin, instead of projecting as far as the teeth, as it does in the European, recedes considerably, as in the monkey. The substance of the cranium is generally thick, and the skull is consequently heavy. The facial angle is about 70 degrees. A more detailed comparison of the Negro cranium to that of the European may be seen in Soemmerring ("De corporis humani fabrica," tom. 1. § 65.) An African head is represented from the decades of Blumenbach in the first plate of the *Anatomy of the Cranium*, fig. 3. A slight comparison of the negro with the European skull will suffice to shew, that the cranium is much more capacious in the latter than in the former case, consequently that it must possess a larger brain. The lateral compression of the Ethiopian head, together with the narrow arched forehead compared to the almost globular European cranium, with its broad expanded frontal portion, sufficiently account for this difference. At the same time the bones of the face are proportionally larger in the African; the foramina for the transmission of the nerves are more ample; and, according to Soemmerring, the nerves arising from the basis of the brain are more considerable. (Ueber die körperliche Verschiedenheit des Negera vom Europaer, § 56.)

The result of these observations, together with the unequivocal similarity in external form between the African cranium, and that of the monkey, leads us inevitably to the inference that the Negro approximates in structure to those animals. The facts, which we possess on this subject, confirm the conclusion which would naturally be drawn from these premises, that the mental faculties of the Negro are inferior to those of the white nations. Let it not however be conceived that these remarks are intended to degrade the African to a level with brutes, or to justify those who consider them merely as a species of monkey. He is distinguished from all animals by the same grand and constant characters which belong to every variety of the human race. We merely state the obvious inferences deducible from acknowledged facts; and consider that a difference in mental powers cannot afford any stronger argument in proof of a diversity of species, than the numerous distinctions in bodily structure. Indeed, when we find the different races of mankind characterized by such numerous differences in bodily structure, it would be a matter of surprise if no diversity could be discovered in their mental endowments.

The description, which we have given above, of the Negro cranium must be understood in a general sense, and not as universally and unexceptionably applicable. Travellers inform us that several Africans differ from the European features and physiognomy only in colour; so that the peculiar formation of the cranium, on the faith of which some philosophers would class these people as a distinct species, is by no means a constant character.

This diversity of features is proved by delineations of Africans, executed by the most skillful artists; and by the views, which Blumenbach has exhibited, of six African heads, all differing from each other. ("Decas prima," tab. 6, 7, 8. "Decas altera," tab. 17, 18, 19). These drawings fully justify his conclusion; "genuinos Æthiopes, si cranium formam spectes, non minus certè, imo vero magis passim inter se ipsos ab invicem differre, quam nonnulli eorum a multorum Europæorum capitis forma differunt." "Decas altera," p. 13.

In the two following varieties the form of the cranium is not so strongly characterized, as in the three which we have

have already considered. They form indeed two intermediate gradations, between the European and the Mongolian, on one side, and the African on the other.

The fourth, or *American variety*, includes all the Americans, excepting the inhabitants of the northern part of the continent, which we have classed with the Mongolian division.

In this variety the cheeks are broad, but the malar bones are more rounded and arched than in the Mongolian; and not expanded to such an extent on either side, nor possessing such an angular form. The orbits are generally deep. The form of the forehead and vertex is influenced in many instances by the efforts of art. The cranium is generally smooth.

The two crania, which are exhibited in the first plate of the *Anatomy of the Cranium*, (figs. 5 & 6,) in illustration of this variety, are taken from the 10th and 20th plates of Blumenbach's work. Both of them display the effects of art in the form of the forehead; but the operation of this cause is most unequivocal in that which wants the lower jaw. Two crania, exactly similar to this latter one, are delineated in the ("Memoires de l'Academie des Sciences de Paris," 1740, by Hunauld; and in the "Journal de Physique," of April 1789, by Arthaud.)

The concurring reports of several travellers concerning the methods employed by the Caribs to effect this alteration in the shape of the cranium, leave no doubt as to the truth of the fact. Hence we cannot help admiring the sceptical diffidence of various moderns, who have questioned the possibility of impressing these unnatural formations on the cranium. (Sabatier in his "Traité complet d'Anatomie," Camper in his "Dissertation sur les differences," &c. and Arthaud in the "Journal de Physique," 1789.) It should appear from the relation of travellers, that the Caribs practise different methods of accomplishing their object; as by tying a plate of wood on the forehead; or by compressing the head between two plates; (Thibault de Chanvalon "Voyage à la Martinique," p. 39.) or by pressure with the hand. The former is probably the most common method. "The Caribs," says Labat in his "Voyage aux îles de l'Amerique," tom. ii. p. 72, are all well made and proportioned; their features are sufficiently agreeable, excepting the forehead, which appears rather extraordinary, as it is very flat, and, as it were, depressed. These people are not born so, but they force the head to assume that form, by placing on the forehead of the newly born child, a small plate, which they tie firmly behind. This remains until the bones have acquired their consistence; so that the forehead is flattened to that degree, that they can see almost perpendicularly above them without elevating the head." To remove all further doubt on the subject, the instruments and bandages, by which the pressure is made, are delineated and described by Dr. Amic of Guadaloupe, in the 39th vol. of the Journal de Physique.

The fifth, or *Malay variety*, including the inhabitants of the numerous Asiatic islands, and those of the great Pacific ocean, constitute an intermediate link between the European and Negro. The cranium is moderately narrowed at its upper part; the forehead rather expanded; and the upper jaw slightly prominent.

The characters which distinguish the crania of the different varieties are sufficiently striking and constant to be observed in very young subjects. This is shewn by the three last plates of the third decade of Blumenbach, which represent specimens of the three first varieties.

Causes of the peculiar national forms of the Cranium.

We cannot, at present, deliver any satisfactory account of the causes of those differences which unquestionably prevail in the form of the cranium in the different varieties of the human species; much less are we able to understand the manner, in which any assigned cause may be supposed to operate in producing its effect. Yet we think it right to lay before the reader Blumenbach's remarks on this point, as they tend, in some degree, to elucidate the subject.

The bones are the most solid parts of the human body, and form a kind of firm support and foundation on which the softer structures rest. Yet physiological experiments, and the phenomena of disease prove, that they are much more subject to change, than the softer parts of the body. Their elements are continually melted down, and removed in an imperceptible manner by the absorbents; while the loss thus occasioned is repaired by the deposition of other particles newly secreted from the blood. This continual change in the bony materials of our body, which is going on from the first period of their formation, occasions them to accommodate themselves to the neighbouring parts, and to become, as it were, formed and fashioned by their action.

The conformation of the head in the more advanced periods of life affords the most unequivocal proof of this circumstance. The internal surface of the cranium exhibits a mould of the lobes and convolutions of the brain, to which it was adapted; and the external surface displays the most manifest impressions from the actions of the muscles, as well as traces of the form of the features, the general expression and configuration of which may be easily conjectured from the view of the denuded cranium.

If then it can be proved that climate has a great effect in modifying the form of the face, (and that it has that effect can be clearly shewn, see Blumenbach's "De generis humani varietate nativa," § 57. ed. 3.), the same cause must exert a powerful influence on the cranium, and particularly on the bones of the face, although in a less direct way.

Besides the chief and leading cause, other accessory ones may contribute to the same effect. Thus there is we think no inconsistency in allowing that considerable and long continued pressure may have an effect on the bones of the face. The skull of a New Hollander in the possession of Blumenbach ("Decas tertia," tab. 27.) is characterized by a remarkable flatness of the upper jaw, where it contains the incisor and canine teeth. This formation can only be attributed to the whimsical custom which those barbarians have, of wearing ornaments in a perforation of the septum nasi, of such magnitude as to obstruct the nostrils, and prevent them from breathing through those openings.

It happens, however, much more frequently that the bones of the skull receive a peculiar, and, as it may be called, national form, from various artificial causes. Not to mention the flattened occiput of the Germans in the time of Vesalius, who attributed it to the manner in which children were placed in their cradles, there can be no doubt, as we have already stated, that the form of the forehead in the Carib cranium is owing to artificial pressure. A similar rage for improving the shape of the head has been very prevalent in the continent of America. "The Indians," says Adair, "flatten their heads in divers forms; but it is chiefly the crown of the head they depress, in order to beautify themselves, as their wild fancy terms it: for they call us *long-heads*, by way of contempt." (History of the American Indians, p. 8.) The method by which they accomplish their purpose is thus described by the same author: "They

fix the tender infant on a kind of cradle, where his feet are tilted above a foot higher than a horizontal position; his head bends back into a hole made on purpose to receive it, where he bears the chief part of his weight on the crown of the head, upon a small bag of sand, without being in the least able to move himself. By this pressure, and their thus flattering the crown of the head, they consequently make their heads thick, and their faces broad." (p. 9.)

Various other methods have been practised, both by manual pressure, bandages, and other instruments, for reducing the cranium to certain particular forms, both in ancient times, and in European as well as other more remote nations. We know that such customs have existed formerly, or do exist at present in some parts of Germany, in the Netherlands, among the French and Italians, the inhabitants of the Grecian Archipelago, the Turks, the Macrocephali near the Euxine sea, the modern Sumatrans, the inhabitants of the Nicobar islands, and particularly in many parts of America, as the inhabitants of Nootka Sound, the Chactaws of Georgia, the tribes of Carolina, the Caribs, the Peruvians, and the Maroon Negroes of the Antilles. (For the numerous quotations in which this fact is stated of the above-mentioned nations, the reader is referred to Blumenbach "De Gen. Hum. Var. Nat." p. 216, 218.) It is a matter of surprise that any person should have dared to call in question the truth of a fact which is supported by the concurrent testimony of so many eye-witnesses. The practice in question has given rise to the names by which several tribes both in North and South America are distinguished. "The word *Omaguas* as applied to a nation of Peru, as well as that of *Cambevas*, in the language of Brazil, signifies *flat-head*: for these people have the strange custom of pressing the forehead of their newly-born children between two plates, in order to make them, as they say, resemble the full moon." (Condamine in the "Memoires de l'Acad. des Sciences de Paris," 1745. p. 427.) Hence also the "têtes de boule," and "têtes plates," of Charlevoix. ("Histoire de la Nouvelle France," tom. 3. p. 187, 323.) In further proof of these practices, we find that they have been prohibited by the Spanish ecclesiastical councils. J. S. de Aguirra, in the "Collectio maxima conciliorum omnium Hispaniæ et novi orbis." Romæ, 1755. fol.) relates a decree which passed in the third synod of the diocese of Lima, against the Indian method of deforming their children's heads. "Cupientes penitus extirpare abusum, et superstitionem, quibus Indi passim infantum capita formis impriment, quas ipsi vocant *Caito, coma, opalia*; statuimus & precipimus," &c. &c. recounting various punishments against the delinquents; as, for instance, that a woman who has committed such an offence, "frequentet doctrinam per continuos decem dies mané & vesperi pro primâ culpâ; pro secundâ vero, per viginti," &c.

Nevertheless, however clearly the fact itself may be proved, people will still be inclined to doubt of what has been often asserted since the time of Hippocrates; *viz.* that these peculiar forms of the head, produced in the first instance by artificial pressure continually practised for a long series of generations, have passed at length, in the progress of time, by a kind of hereditary descent, to the offspring, so as to have become a second nature. There is a well known passage in the celebrated work of Hippocrates, "De aeribus, aquis & locis," concerning the Macrocephali, a nation situated near the Euxine sea. He states that no other people have the cranium of such a form as these. It was the great object of their ambition to have the head as long as possible: hence arose the practice of moulding with their hands the tender heads of their children. When in its plastic state it

might be compared to the "udum & molle lutum," so as to compel it to assume an elongated form, and of compressing it by means of appropriate bandages and instruments, so as to prevent its growth, except in the direction which they desired. When this custom had been long continued, the peculiar form remained without any farther efforts.

The father of medicine has endeavoured to explain this singular phenomenon by his hypothesis of generation, which is nearly similar to that of Buffon. He supposes the genital fluid to be collected from all parts of the body; and hence that the members of the fetus are fashioned according to those of the parents, from whom this fluid is derived: so that a Macrocephalous father would beget a son of the same formation, &c.

The opinion which supposes that artificial forms of the cranium may ultimately be transmitted to the offspring, so as to constitute national characters, has been contradicted by some physiologists. We cannot at present perhaps determine the question satisfactorily on either side. The transmission of other national marks, as peculiar forms of the features, and of organic diseases, as defects of pronunciation, not to mention various instances in which casual mutilations have passed to the offspring, will induce us to reflect a little before we adopt implicitly the negative side of the question.

We have one remark only to add on this part of the subject; *viz.* that the differences in the form of the cranium are by no means sufficient to authorise us in assigning the different races of mankind, in which they occur, to species originally different; for they are not more considerable, nor even so remarkable as some variations which occur in animals confessedly of the same species. Thus the head of the wild boar is widely different from that of the domestic pig. The different breeds of horses and dogs are distinguished by the most striking dissimilarities in the head: in which view the Neapolitan and Hungarian horses may be contrasted. The wild original of the cow possesses large lacrymal fossæ, which are completely lost in the domesticated animal. The very singular form of the head in the Paduan fowl is a more remarkable deviation from the natural structure than any variation which occurs in the human cranium.

National Peculiarities in the Form of the Teeth.

In the year 1779 Blumenbach discovered a peculiarity in the form of some of the teeth in two Egyptian mummies. The incisors, instead of possessing their ordinary thin cutting edges, were thick in their bodies, and resembled truncated cones: and the canine teeth were only distinguishable from the bicuspides by their situation. The same circumstances have been observed in other specimens; as in a mummy at Cambridge, described by Middleton ("Monumenta Antiquitatis," in his Works, vol. iv. p. 170.); in another at Cassell, (Brückmann's "Description," Brunswick, 1782, 4to.); and in a third at Stutgard ("Storr, prodromus Methodi Mammalium," p. 24.) Blumenbach discovered the same structure in another head of a young mummy, which he opened in London. ("Philosophical Transactions," 1794. part 2.) There must, he observes, be great differences in the crania of various mummies, when it is considered, that the practice of treating the dead body in this manner prevailed in Egypt for so many ages, during which great vicissitudes occurred in the dominion and inhabitants of the country; and consequently that we cannot reasonably expect to find this formation of the teeth in every specimen. Yet it constitutes a singular variety, and deserves mention, as it may assist in distinguishing the mummies of some particular age or nation. It is difficult to assign a cause for this peculiarity of conformation. Blumenbach

menbach ascribes it to the kind of food, which, on the authority of Diodorus Siculus, he states to have consisted chiefly of vegetables, roots, &c. This, he says, would occasion great mechanical abrasion; which, according to him, is attended with an increased thickness of these organs, both in man and animals. If he means that the teeth grow thicker by this cause, after their first formation, the reader will perceive that the explanation must completely fail; as such a growth is quite incompatible with every fact which we possess concerning the structure and economy of these organs.

A similar formation of the teeth was noticed by Winslow in the cranium of a Greenlander from the isle of Dogs, (*Hond-Eyland*) on the west coast of Greenland. "The incisors, says this anatomist, are flat from before backwards, and short; instead of having a cutting edge; hence they resemble grinders more than cutting teeth. The gentleman, who presented me with this cranium, laid that the inhabitants of *Hond-Eyland* eat their meat raw. They move their jaws in a very singular manner, and make several grimaces while chewing and swallowing. It was the observation of this singular spectacle that induced him to seek for an opportunity of discovering whether these islanders possessed any peculiarity of construction in their jaws or teeth." "Memoires de l'Acad. des Sciences de Paris," 1722. P. 323.

This account is confirmed by two Eskimaux crania in the possession of Blumenbach, from Labrador, "Decas Cranior. Tertia." tab. 24. 25, which exhibit the same thickened form and worn appearance of the teeth. It is well known that the Eskimaux are derived from the same race with the Greenlanders, and that their name has its origin from their practice of eating raw flesh.

We doubt much whether there be any real original difference in the form of the teeth in the instances just mentioned: and are rather inclined to refer the observed peculiarity of form to the mechanical attrition, which it appears that the teeth had experienced in all cases. We know very well that the incisor teeth are wedge-shaped, and increase gradually in thickness from their cutting margin to the gum. Hence, if one of these organs be half worn away, it will entirely lose its natural appearance as a cutting tooth, and will resemble in form the teeth found in the crania above-mentioned.

The assertion of Buffon, Erxleben, and others, that the teeth of the Calmucks are longer, and separated by wider intervals from each other, is contradicted by the specimens of their crania in the possession of Blumenbach.

Some other peculiar shapes of the teeth are produced by artificial means. Thus some tribes of Negroes file them so as to make them conical and sharp pointed (Churchill's "Collection of Voyages," vol. v. p. 139. 143. 385. Philof. Transl. vol. 73. pt. 1, p. 92): some of the Malays destroy a great part of the enamel (Forrest's "Voyage to New Guinea, p. 237. Marsden's "History of Sumatra, p. 46); or make grooves on its surface, (Hawkesworth's "Collection of Voyages," vol. iii. p. 349, of the Javanese). Blumenbach states, that he has seen some Chinese and Javanese, who had carefully removed the enamel from the edge of the teeth by means of a stone.

Comparison of the Human Skull with that of Animals.

A very striking difference between man and all other animals consists in the relative proportions of the cranium and face; which are in general indicated by the direction of the facial line.

The two organs, which occupy most of the face, are those of smelling and tasting (including the instruments of mastication, &c.) In proportion as these parts are more developed; the size of the face compared to that of the cranium, is augmented. On the contrary, when the brain is large, the volume of the cranium is increased in proportion to that of the face. A large cranium and small face indicate therefore a large brain with inconsiderable organs of smelling, tasting, masticating, &c.: while a small cranium with a large face shews that these proportions are reversed. The nature and character of each animal must depend in great measure on the relative energy of its different functions: it is in a manner subdued and mastered by its most powerful sensations. We meet with examples of this daily in the human species; but the differences which can be observed between one man and another in this respect, must be much less than those which occur between animals of different species. The brain is the common centre of the nervous system: all our perceptions are conveyed to this part, as to a sensorium commune; and this is the organ by which the mind combines and compares these perceptions, and draws inferences from them—by which in short it reflects and thinks.

We shall find that animals partake in a greater degree of this latter faculty, or at least approach more nearly to it, in proportion as the mass of medullary substance, forming their brain, exceeds that, which constitutes the rest of the nervous system; or, in other words, in proportion as the organ of the mind exceeds those of the senses. Since then the relative proportions of the cranium and face indicate also those of the brain, and the two principal external organs, we shall not be surprised to find that they point out to us, in great measure, the general character of animals; the degree of instinct and docility which they possess; and hence the study of these proportions is of great importance to the naturalist. *Man combines by far the largest cranium with the smallest face:* and animals deviate from these relations in proportion as they increase in stupidity and ferocity.

One of the most simple methods (though sometimes indeed insufficient) of expressing the relative proportions of these parts, is the facial line, which we have already described. In man only is the face placed perpendicularly under the front of the cranium; so that the facial line is perpendicular. Hence the angle formed between this line, and the horizontal one, which passes through the nose and meatus auditorius, is most open, or approaches most nearly to a right angle in the human subject. The face of animals is placed in front of the cranium instead of under it: that cavity is so diminished in size, that its anterior expanded portion, or forehead, is soon lost, as we recede from man. Hence the facial line is oblique: and the facial angle is acute: it becomes more and more so as we descend in the scale from man; and in several birds, in most reptiles and fishes, it is lost altogether, as the cranium and face are completely on a level, and form parts of one horizontal line.

The idea of stupidity is associated, even by the vulgar, with the elongation of the snout, which necessarily lowers the facial line, or renders it more oblique: hence the crane and snipe have become proverbial. On the contrary, when the facial line is elevated by any cause, which does not increase the capacity of the cranium, as in the elephant and owl, by the cells, which separate the two tables, the animal acquires a particular air of intelligence, and gains the credit of qualities, which he does not in reality possess. Hence the latter animal has been selected as the emblem of the goddess of wisdom; and the former is distinguished in
the

CRANIUM.

the Indian language by a name which indicates an opinion that he participates with man in his most distinguishing characteristic, the possession of reason.

The invaluable remains of Grecian art shew that the ancients were well acquainted with these circumstances: they were aware that an elevated facial line formed one of the grand characters of beauty; and indicated a noble and generous nature. Hence they have extended the facial angle to 90 degrees in the representation of men on whom they wished to bestow an august character. And in the statues of their gods and heroes they have carried it beyond a right angle, and made it 100°.

The facial line of the European forms an angle of	80°
Negro - - - - -	70°
Orang-utang - - - -	58°
Monkey - - - - -	42°

These are represented in the second plate of the *Anatomy of the Cranium* (figs. 4, 5, 6, 7, & 8). In some other mammalia the angle is no more than about 20°.

The boundaries of the facial angle in the human subject are therefore 70° and 80°. A smaller angle than the former constitutes an approach to the monkey. Yet it may be extended beyond the latter, as the Greeks have done in their representations of the deity: here however 100° seems to be the *ne plus ultra*; beyond which the proportions of the head would appear deformed.

That angle, according to Camper, constitutes the most beautiful countenance, and hence he supposes the Greeks adopted it. "For," says he, "it is certain that no such head was ever met with; and I cannot conceive that any such should have occurred among the Greeks, since neither the Egyptians, from whom they probably descended, nor the Persians, nor the Greeks themselves ever exhibit such a formation on their medals, when they are representing the portrait of any real character. Hence the antient model of beauty does not exist in nature, but is a thing of imaginary creation; it is what Winkelmann calls "*beau ideal*."

A vertical section of the head, in the longitudinal direction, shews us more completely the relative proportions of the cranium and face. In the European, the area of the section of the cranium is four times as large as that of the face; the lower jaw not being included. The proportion of the face is somewhat larger in the Negro; and it increases again in the orang-utang. The area of the cranium is about double that of the face in the monkeys; in the baboons, and in most of the carnivorous mammalia, the two parts are nearly equal. The face exceeds the cranium in most of the other orders of mammalia. In the ruminant animals the area of the face is about double that of the cranium, and it is nearly four times as large in the horse.

The outline of the face, when viewed in such a section as we have just mentioned, forms in the human subject a triangle; the longest side of which is the line of junction between the cranium and face. This extends obliquely backwards and downwards from the root of the nose towards the foramen occipitale. The front of the face, or the anterior line of the triangle is the shortest of the three. The face is so much elongated, even in the monkeys, that the line of junction of the cranium and face is the shortest side of the triangle; and the anterior one is the longest. These proportions become still more considerable in the other mammalia.

The *great occipital foramen* holds a very different situation in animals from that which it possesses in the human subject; and its position again differs considerably in the various species. These differences arise chiefly from the ordinary

attitude of the body, and from the form of the head. The head and neck of man being directed vertically, his head is placed in a state of equilibrium on the vertebral column, in order to facilitate its motions, and to maintain it firmly on the point of support, which it possesses in the natural attitude of the body. Hence the great occipital hole is placed in the human subject nearly in the centre of the *basis cranii*; and is very little more distant from the front of the jaws, than from the posterior extremity of the occiput. The position of the head is so favourable for its being held in a state of equilibrium, that if the vertical line of the trunk and neck were continued upwards, it would pass through the top of the head.

The occipital hole differs therefore considerably from that of animals in its direction. Let us draw a line according to the course or level of this opening: it will pass from the posterior edge of the foramen, along the surface of the condyles, and if continued anteriorly, will terminate just under the orbits. It forms in short almost an horizontal line, which intersects, nearly at right angles, the vertical line of the body and neck, when the head is held straight, without being inclined forwards or backwards.

In this attitude, the face is in a vertical line parallel to that of the body and neck; and consequently the jaws hardly extend in front beyond the forehead. They are very short in comparison with those of most animals: for the length of the lower maxillary bone of man, measured from the chin to the posterior edge of the condyle is only half the length of the whole head, as taken from the chin to the occiput; and scarcely the ninth part of the height of the body from the anus to the vertex: and about the eighteenth part of the whole length of the body from the top of the head to the feet. This latter point of comparison is however scarcely applicable to the subject; inasmuch as there is hardly any other animal but man, which has the hind legs as long as the trunk, neck, and head taken together, and measured from the vertex to the pubis.

The principal constituent parts of the human structure are the same with those of animals; but there is as much difference in the mode of union, and form of the bones, as in the attitude of man, compared to that of animals. Let us suppose a man to assume the attitude of a quadruped, and that he should attempt to walk on all fours; he will find himself in a very unnatural position. The motions of his arms, legs, hands, feet, and head, will be very laborious; and it will be impossible for him to acquire a firm gait and regular progression. The obstacles, which he experiences, arise from the conformation of the pelvis, hands, feet, and head: the latter only come within the scope of the present article.

In proportion as the volume of the brain increases in comparison to that of the whole body, so does the occiput become more convex and prominent; the foramen magnum is removed further from the back of the head; and the level of this opening approaches the horizontal direction. Hence, as we have already remarked, it is but little further in man from the extremity of the jaws than from the back of the head, and its direction is nearly horizontal. This position of the opening, which places the head in a state of equilibrium upon the neck, and brings the face forwards in the natural erect posture, would, if man went on all fours, prevent him from elevating the head sufficiently to see before him, because the motion of the head would be stopped by the projection of the occiput meeting the vertebrae of the neck.

In most animals the great occipital foramen is placed at

the back of the head; the jaws are considerably elongated; the occiput forms no projection beyond this opening, the level of which is in a vertical line, or at least very slightly inclined. Hence the head is connected to the neck by its back part, instead of being articulated, as in man, by the middle of its basis; and, instead of being in equilibrium, it hangs to the front of the neck. This structure bestows on quadrupeds the power of using their jaws for seizing what is before them; of elevating them to reach what may be above the head, although the body be placed horizontally; and of touching the ground with the mouth by depressing the head and neck as low as the feet. The latter motion could not be performed by man, even if he were in the attitude of a quadruped; for if he lowered the head to the ground, he would only touch it with the forehead or vertex.

In several animals there is some distance between the foramen magnum, and the posterior extremity of the occiput; but this interval is no where so considerable as in the human subject, and in proportion as it is increased does the direction of the occipital foramen approach more to the horizontal one.

Animals of the monkey kind approach more nearly to the human structure in the position and direction of the occipital foramen than any others. In the orang-utang it is twice as far from the jaws as from the back of the head; and it is considerably inclined downwards, so that a line drawn in its level passes below the lower jaw, instead of going just under the orbit as in man.

The difference in the direction of the foramen may be estimated by noting the angle formed by the union of a line drawn in the manner above-mentioned, according to the direction of the opening, with another line passing from the posterior edge of the foramen to the inferior margin of the orbit. This angle is of 3° in man, and of 37° in the orang-utang. The length of the jaws in this animal must exceed that of the human subject in the same proportion: the lower maxilla is one fourth of the length of the trunk and head, taken from the vertex to the anus, while in man it is only one seventh.

The occipital angle is of 47° in the lemur; it is still greater in the dog; and in the horse it is of 90° , or a right angle, the position of the opening being completely vertical.

The want of the intermaxillary bone has been set down by Camper as one of the grand characteristics which distinguish the human head from that of other animals. The superior maxillary bones of the human subject are united to each other, and contain the whole of the upper series of teeth. They are, however, separated in brutes by a third bone of a wedge shape, which contains the incisor teeth, and therefore was called *os incisivum*. It is united by peculiar sutures to the neighbouring bones.

That man possesses nothing analogous to the intermaxillary bone of brutes is so clear, that we must be surprised how so excellent an anatomist as Vicq-d'Azyr could discover any analogy in the human jaw to the structure of quadrupeds. "Memoires de l'Acad. des Sciences de Paris," 1780. The transverse slit behind the incisor teeth, which is constantly observable in the young subject, and sometimes distinguishable in the adult, was very well known to the older anatomists. But that this fissure could not deserve the name of a suture, was very correctly observed more than two hundred years ago by the acute Fallopius. (See its description in the account of the bones of the face.)

Whether all other mammalia, besides the human subject, possess this bone, is not so decidedly ascertained, as that man has it not. Blumenbach mentions, that it does not appear

in several crania of the genus *simia*, which he examined. "De Gen. Hum. var. Nat." p. 38. Neither Tyson nor Daubenton found it in the ourang-utang. However this question may be decided, there can be no doubt that the crania of all the quadrumanous mammalia, which are the most anthropomorphous animals, as well as of all other quadrupeds, are distinguished from the human skull by the great length and projection of the jaws.

The teeth of the human subject differ from those of all mammalia in being placed close to each other, and arranged in an uniform and unbroken series. The lower incisors are perpendicular, which is altogether a peculiar character of the human head. The cuspidati do not project beyond the others, nor are they separated by any intervals from the neighbouring teeth. The molares are furnished with peculiar blunt prominences or tubercles very different from those of any of the monkey kind.

The lower jaw of the human cranium is characterized by three very remarkable circumstances: its peculiar shortness; the prominence of the chin, which arises from the perpendicular position of the lower incisor teeth; and by the form, direction, and mode of articulation of the condyles, which circumstances differ from the structure of all other animals, and clearly shew that man is designed by nature to be an omnivorous animal.

CRANIUM, in *Natural History*, the name of a species of the *Anomia*, with a smooth ventricose shell, transversely striated, found in the Norwegian sea. Also, a species of *Alcyonium*, tuberiform, white, and setose; found in the same sea with the former.

CRANK, a contrivance in machines, in manner of an elbow, only of a square form; projecting out from an axis, or spindle; and serving, by its rotation, to raise and fall the pistons of engines for raising water, or the like.

CRANK, in *Sea Language*. A ship is said to be *crank-sided*, when, for want of a sufficient quantity of ballast or cargo, she cannot bear her sails, or can bear but small sail without danger of oversetting.

She is said to be *crank by the ground*, when her floor is so narrow, that she cannot be brought on ground without danger.

CRANK is also an iron brace which supports the lanterns on the poop-quarters, &c.

CRANMER, THOMAS, in *Biography*, the most eminent prelate that ever filled the see of Canterbury, was born July 2, 1489, at Ashtedon, in Nottinghamshire. At the age of 14 he was admitted to Jesus College, Cambridge. By his great diligence in his academical studies, and by his zeal in the pursuit of biblical knowledge, he acquired very high reputation, and quickly obtained a fellowship and the degree of M. A. The former he soon lost by marrying; but his wife dying within a year of his entering the holy state, he was again admitted fellow of his college, a rare circumstance, and at the same time a signal proof of the respect and affection in which he was held by his friends. By Cardinal Wolsey he was offered a fellowship at Oxford, which he did not accept; and in 1523 he took the degree of D.D., and was appointed theological lecturer and examiner: in both capacities he rendered the most essential services to the interests of learning and religion. He had not, however, long retained these offices before the plague obliged him to retire for safety to Waltham Abbey, where, meeting with Dr. Fox, the king's almoner, and Dr. Stephen Gardiner, the secretary, the conversation turned on the subject of the king's divorce from Queen Catharine. In giving an opinion on this subject, he said the question must be reduced to this; "Whether a man may marry his brother's

S f wife?"

wife;" which might be discussed and decided by the authority of scripture, in this country as well as at Rome. When Henry was informed of this reply, he not only applauded Cranmer's sagacity, affirming that "he had got the right fow by the ear," but desired to be introduced to him. He immediately appointed him one of his chaplains, and commanded him to write in justification of the intended divorce. The doctor quickly produced a work which completely coincided with the monarch's views, by proving from the scriptures, and by an appeal to the decisions of general councils and ancient writers, that the pope possesses no power to dispense with the word of God. Cranmer argued the point so successfully at Cambridge, and made so many converts to his opinion, that he was sent by his sovereign to debate the matter on the continent with the divines of France, Italy, and Germany. While on this mission he married a second wife at Nuremberg; and on his return in 1533, he was raised to the high office of archbishop of Canterbury, with the sole view, no doubt, of sanctioning the conduct of the king; and accordingly in the following May, he pronounced the sentence of divorce between Henry VIII. and Catharine, and confirmed the king's marriage with Anne Boleyn. These acts excited the vengeance of the pope, who threatened to excommunicate the archbishop; but he had already set at defiance his power, by refusing to accept his office, unless it were bestowed immediately by his own sovereign without the intervention of his holiness. He therefore heard the denunciations uttered against him without anxiety, and exerted all his powers in behalf of the Reformation. In the same year he was very instrumental in procuring an act of parliament which abolished for ever the pope's supremacy in these realms, and which declared the king supreme head of the church. His next objects were, the translation of the scriptures into English, and the dissolution of monasteries, which had long been regarded as incompatible with those principles of virtue and religion, in behalf of which they had been originally instituted. In these efforts the primate was successful, and having already joined the king in so many of his projects, he was obliged to follow him still farther, and in 1536 he pronounced a second divorce between Henry and Anne Boleyn. In all the changes and reforms introduced by the king, his sole object was the acquisition of new power and increased wealth, and when he had secured his wishes in these respects, he began to counteract farther innovations, and caused an act to be passed which impeded the progress of reformation during the remainder of his reign. By a provision in this law, the archbishop was obliged to banish his wife to her native home. With this act of violence Cranmer did not comply without exhibiting a manly opposition, which extorted the admiration and respect of the monarch, though his enemies fondly imagined it would effect his ruin. In 1540 he was appointed a commissioner for inspecting into matters of religion, and for explaining some of its chief doctrines: the result of this commission was the circulation of a work, chiefly composed by Cranmer, entitled "A necessary Erudition of any Christian Man." After the death of Thomas Cromwell, earl of Essex, in whose behalf he interceded with all the warmth of friendship, though ineffectually, he retired from court, and gave himself up to his own affairs as an ecclesiastic. The high rank to which he had attained, rendered him an object of envy to those less honoured, and who eagerly sought his ruin; but in every change he was protected by the king, who eventually appointed him one of the executors of his last will, and one of the regents of the kingdom.

Upon the demise of Henry, in 1546, Cranmer crowned

the young king, and was, during the short reign of that sovereign, very zealous in promoting the reformation. He took a very active part in composing, correcting, and establishing the liturgy, and in compiling the 39 articles. At this period, it cannot be denied, the archbishop exercised his power with cruelty, and without that regard to the rights of conscience in others, which he had formerly claimed for himself. He sanctioned, and was even the abettor of persecution, in the cases of Gardiner bishop of Winchester, and Bonner bishop of London; and by his authority and approbation other considerable men of the Romish church were imprisoned and persecuted, on account of their opinions and attachment to rites and ceremonies, against which he had set his face. It does not appear what part he took in the persecution of Lambert and Askew during the reign of Henry, who were cruelly murdered for avowing doctrines to which Cranmer himself afterwards adhered: but his conduct in regard to Joan Bocher and George Van Paris cannot be too strongly reprobated. These, says Mr. Gilpin, were accused, one for maintaining, and the other for denying the divinity of Christ. The woman was highly respected, and zealously attached to the reading and explaining of those scriptures which Cranmer had caused to be put into her hands, in common with those of her countrymen. He was the cause, therefore, as well as the instrument of her cruel death. The good woman saw, or thought she saw, that Jesus of Nazareth was a man, like other men, only in the high degree of inspiration which he had from his Almighty Father. Being exhorted to abjure so damnable a doctrine, she refused, and preferred death rather than life on such ignominious terms, and she was accordingly committed to the flames. To the honour of the young king, and the disgrace of his minister, let it be noted, that the mind of the former revolted against the signing of the warrant for Bocher's execution, and it was only by Cranmer's persuasions and importunity that he was brought to yield. Even then he deprecated the act, and with tears declared, that if he did wrong, the archbishop must answer for it at the tribunal of heaven.

In the year 1553, he shewed himself adverse to the settlement of the crown on Lady Jane Grey, though he was at length persuaded to set his hand to it; and on the death of Edward he avowedly espoused her cause, and became a member of her council. The triumph of Mary forewarned him that he had little to hope for. Clemency, and even justice, were well nigh banished from the new court, and the friends of Cranmer urged him to seek for safety by retiring to a foreign country. But feeling that the dignity of his character, and the cause of the reformation required him to make a stand, he replied it would not be fit for him to leave his post, and thus, as it were, disavow the changes that had been made, by his means, in religion, during the late reign. It was now, probably, that the prediction of Christ to Peter must meet the mind of Cranmer: "They that take the sword shall perish by the sword."

He had been a persecutor, and must fall by the same merciless means. He was tried on a charge of high treason, in joining the party of Lady Jane; of this he was convicted, when his see was declared vacant, and the fruits of it sequestered. He supplicated for pardon, which was granted, but only that he might be tried on the charge of heresy, of which he was also convicted. As yet the pope's authority had not been re-established in England, and it was thought necessary to repeat the mock trial, on an indictment charging him with blasphemy, perjury, incontinency, and heresy. On this occasion Cranmer refused every testi-

mony of respect to the representative of the pope, and defended himself with ability, and much firmness. But reason had no effect with judges who were endeavouring to banish reason from the world: he was condemned, and most cruelly treated, especially by Bonner, whose name has been transmitted to posterity with the infamy it merits. The archbishop bore all with an undaunted heroism, till the prospect of death overcame his virtuous resolution; then he signed a recantation of his religious principles. His enemies having thus obtained a signal victory, lost no time in printing and dispersing every where the recantation, determined, at the same time, to take away his life. On the 24th of February, a writ was signed for burning Cranmer, and on the 24th of March he was brought to St. Mary's church, Oxford, to hear a discourse, previously to the fatal tragedy. Dr Cole, provost of Eton, was appointed to preach on the occasion; while he was haranguing the audience, the unfortunate prisoner expressed the greatest contrition for having been betrayed into the dastardly act of recantation, but the spectators supposed that the tears which he shed were on account of his former heresy. At length, Cole, with a malignant countenance, desired him to make an open profession of his faith; when Cranmer avowed his belief in all that had been taught by Christ and his apostles, in the New Testament, and by the prophets in the Old. "And now," added he, "I come to that which hath so much troubled my conscience, more than any thing I ever did or said in my whole life; and that is the setting abroad a writing contrary to the truth, which I here now renounce, as things written with my hand contrary to the truth which I thought in my heart; and written for fear of death, and to save my life if it might be. And so far as my hand offended, contrary to the dictates of my heart, my hand shall be first punished." Astonished and enraged at this unexpected declaration, the bigotted and savage mob dragged him to the place of martyrdom, where he was quickly fastened to the stake; here his resolution was undaunted, and he nobly obliterated the stain which had been made upon his character by recantation. "This is the hand that wrote it," says he, "and therefore it shall first suffer punishment." He accordingly stretched his right hand into the flame, where he kept it unmoved till it was consumed. In a short time the fire attacked his vital parts, and he died repeating the words of the martyr Stephen, "Lord Jesus, receive my spirit." Such was the end of Thomas Cranmer, in the 67th year of his age: that he was a great and good man in many respects none will deny; but it would be foolish, and to posterity unjustifiable, to attempt to conceal his faults. He was, says Mr Hume, "undoubtedly a man of merit, possessed of learning and capacity, and adorned with candour, sincerity, and beneficence, and all those virtues which were fitted to render him useful and amiable in society. His moral qualities procured him universal respect, and the courage of his martyrdom, though he fell short of the rigid inflexibility observed in many, made him the hero of the Protestant party." There are, however, others who can better appreciate the worth of the archbishop than our historian. Mr Gilpin, speaking of the noble stand which Cranmer made against the king with regard to the six articles, says, "The good archbishop never appeared in a more truly Christian light, than on this occasion. In the midst of so general a defection, he alone made a stand. Three days he maintained his ground, and baffled the arguments of all opposers. But argument was not their weapon, and the archbishop saw himself obliged to sink under superior power. Henry ordered him to leave the house. The primate refused. "It was God's business," he said, "and not

man's:" and, when he could do no more, he boldly entered his protest. Such an instance of fortitude is sufficient to wipe off many of those courtly stains which have fastened on his memory." His behaviour as a Christian, in the forgiveness of injuries, which is the touchstone of pure principles, was exemplified in the cause of the duke of Norfolk. "The last act of this reign," says Gilpin, "was an act of blood, and gave the archbishop a noble opportunity of shewing how well he had learned to forgive an enemy." Henry had ordered the duke of Norfolk to be attainted contrary to justice. No man had been more the enemy of Cranmer than the duke; yet, so far was he from exulting in the opportunity of vengeance, that he viewed the measure with horror, and opposed the bill with all his might; and, when his opposition was vain, he left the house with indignation, and retired to Croydon.

To men of learning, Cranmer was a generous patron and friend; he maintained an intimate and constant correspondence with most of the distinguished scholars in Europe. He was a great economist of his time, rising generally, at all seasons, at five in the morning, and employing every hour with industry and care. In his manner he was pleasing and amiable; mild and cheerful in his temper; and given to hospitality, often beyond the ample means which he enjoyed. As a preacher, he is said to have been plain, practical, and impressive; and the character of his writings is that they are more sensible and nervous, than elegant and polished. He left behind him a widow and children, that had been amply provided for by Henry VIII., who, without any solicitation, gave him a considerable grant from the abbey of Welbeck in Nottinghamshire, which his family enjoyed after his decease. King Edward made some addition to his private fortune, and his heirs were restored in blood by an act of parliament, passed in the reign of Elizabeth. The writings of the archbishop are not stamped with the marks of great superiority; though some have been translated into Latin by Young and Sir John Cheke. Some posthumous pieces were published by Strype and Burnet, and there remain, in the library at Lambeth, two large volumes of MSS. chiefly collections from the Scriptures, and the writings of the Fathers. Cranmer was, according to Burnet, very anxious in obtaining the sense of ancient writers upon all the topics of religion, by which he might be directed in the cause of the reformation. *Biog Brit.*

CRANNICHFELD, in *Geography*, a small town of Germany, in the duchy of Saxe-Gotha, situated on the river Ilm, and surrounded on all sides by mountains. It has 250 houses, and 1300 inhabitants, most of whom are tradesmen and manufacturers, chiefly basket-makers and stocking-weavers.

CRANNY, in the *Glass Trade*, a round iron, whereon the workmen in the glass-houses roll the glass, to make the neck of it small.

CRANON, in *Ancient Geography*, a town of Thessaly, in the valley of Tempe; east of Pharsala, and west of the lake Bœbeis, 100 stadia south-west of Gyrtora—Also, a town of Greece, in Athamania, towards the source of the Achelous.

CRANSAC, in *Geography*, a small town of France, in the department of the Aveyron, fifteen miles from Rhodéz, famous for its mineral waters. The springs are in the midst of arid mountains which emit clouds of black smoke of rather a disagreeable smell. They have not all the same properties. That which is called the new spring is most frequently used. The water is cold, limpid, and without smell; it tastes like a slight solution of sulphate of iron. It appears that it holds little saline matter, since it has been found that

367 grammes (twelve ounces) of this water give only 1 gramme 6 decigrammes (eighteen grains) of saline residue in which there is sulphate of iron.

A sensible analogy has been observed between the water of Cranfac, and that of Passy near Paris, with respect to their component parts, as well as to their effects. Physicians therefore prescribe the two waters indiscriminately.

Cranfac water is reckoned good for the stomach. It is ordered in cases of green-sickness, liver complaints, cutaneous affections and diseases of the bladder. It is extremely purgative at first, and even creates vomiting, but at the end of four or five days it operates less violently, and is generally beneficial. It must be used cold.

CRANSTON, a township of America, being the south-easternmost of Providence county, in Rhode Island, situated on the west bank of Providence river, five miles south of the town of Providence. The compact part of the town contains 50 or 60 houses, a baptist meeting-house, handsome school-house, a distillery, and a number of saw and grist mills; and is called Pawtuxet, from the river on both sides of whose mouth it stands, and over which is a bridge connecting the two parts of the town. The whole township contains 1877 inhabitants.

CRAN-TARA, an implement used in war among the ancient Britons. It was a stick burnt at the end and dipped in the blood of a goat, which, after striking the shield and sounding the horn, was sent by a swift messenger to the nearest hamlet, where he delivered it, without saying one word, except the name of the place of rendezvous. This crantara, which was well understood to denounce destruction by fire and sword to all who did not obey this summons, was carried with great rapidity from village to village; and the prince, in a little time, found himself surrounded by all his warriors, ready to obey his commands.

CRANTIA, in *Ancient Geography*, a maritime town of Spain.

CRANTOR, in *Entomology*, a species of *Sphinx*; which see.

CRANTOR, the *Moralist*, in *Biography*, the last celebrated philosopher of the Old Academy, the intimate friend of Arcefilaus, a native of Soli in Cilicia, who flourished about 300 years B. C., and died about the 270th year B. C. He studied under Xenocrates and Polemo; and adhering to the Platonic system, he was the first who wrote commentaries on the works of Plato; but as he died before Polemo and Crates, he could not succeed them in the Academic chair. Crantor was highly celebrated for the purity of his moral doctrine, as we may infer from the praises that are bestowed by the ancients upon his discourse "On Grief," which Cicero (*Acad. Quest.* l. iv. c. 44. *Tusc. Qu.* l. iii. c. 6.) calls "a small but golden piece, adapted to heal the wounds of the mind, not by encouraging stoical insensibility, but by suggesting arguments drawn from the purest fountains of philosophy." That Crantor acquired great reputation as a moral preceptor is intimated by Horace. (*Ep.* l. i. ep. 2. v. 3.)

"Qui, quid sit pulchrum, quid turpe, quid utile, quid non,
Planius et melius Chryssippo et Crantore dicit."

"Who better taught fair virtue's sacred rules,
Than Crantor and Chryssippus in the schools."

Diog. Laert. lib. iv. 24.

CRANTZIA, in *Botany*, Swartz. Vahl. See *TRICERA*.

CRANTZPERG, in *Geography*, a castellated town of Germany, in the circle of Bavaria; 16 miles N.N.E. of Munich.

CRANZIA, in *Botany*, Schreb. See *SCOPOLIA*.

CRAON, in *Geography*, a small town of France, in the department of Mayenne, chief place of a canton, in the district of Chateau Gonthier. It has 1494, and the canton itself 12 746 inhabitants. The latter comprises 15 communes, on a territorial extent of 240 kilometres.—Also, a castle, and formerly a principality, in the department of Meurthe; 3 miles E. of Luneville.

CRAONNE, a small town of France, in the department of Aisne, 12 miles S.E. of Laon. It is the chief place of a canton, in the district of Laon, with a population of 830 individuals. The canton itself has 40 communes, and 12,148 inhabitants, upon a territorial extent of 207 kilometres.

CRAP, in *Agriculture*, a name sometimes given by farmers in some districts to ray-grass, rye-grass, or red darnel (*lolium perenne*), and in others to buck-wheat (*polygonum sagopyrum*); the former of which is often very troublesome among wheat crops.

CRAPACH, or KRAPACH, in *Geography*, is the name of that chain of mountains called the *Carpathian hills*, which form the western boundaries of Hungary, and separate Transylvania from Gallicia. They are now called, in the language of the country, *Tatra*.

CRAPE, a light transparent stuff, in manner of gauze; made of raw silk, gummed and twisted on the mill; woven without crossing, and much used in mourning.

Crapes are either *craped*, i. e. *crisped*; or *smooth*: the first *double*, expressing a closer mourning; the latter *single*, used for that less deep. Note, White is reserved for young people, or those devoted to virginity.

The silk destined for the first is more twisted than that for the second; it being the greater or less degree of twisting, especially of the warp, which produces the crisping given it when taken out of the loom, steeped in clear water, and rubbed with a piece of wax for the purpose.

Crapes are all dyed raw. The invention of this stuff came originally from Bologna; but the chief manufacture of it is said to be at Lyons.

History tells us, that St. Bathilda, queen of France, made fine crape, *crepa*, of gold and silver, to lay over the body of St. Eloy. The Bollandists own they cannot find what this *crepa* was. Binet says, it was a frame to cover the body of the faint; but others, with reason, take it to be a transparent stuff, through which the body might be seen; and that this was the *crepa* whence our word crape was formed.

CRAPENO, in *Geography*, a town of Naples; 20 miles W. of Vieste.

CRAPONNE, a town of France, in the department of the Upper Loire, 15 miles N. of Le Puy. It is the chief place of a canton, in the district of Le Puy, and contains 3293 inhabitants. The canton itself has but 6 communes, and a population of 7956 individuals, upon a territorial extent of 127 kilometres and a half.—Also, a canal, in the department of the Bouches du Rhône, fed with the water of the river Durance; which, after having traversed and fertilized the plain called *La Crau d'Arles*, falls into the Rhône at Arles. It is not navigable, but it serves to set a great number of mills in motion.

CRAPULA, a surfeit by over-eating and drinking. See *SURFEIT*.

CRASHAW, RICHARD, in *Biography*, an English poet, was the son of a clergyman, and educated first at the Charter-house, and then at Pembroke-hall and Peter-house, Cambridge, of which last he was a fellow in the year 1637. At college he was distinguished for his talents in poetry, Latin as well as English; but being a man of strict integrity, he sub-

mitted,

mitted, in 1644, to expulsion from the university with others, rather than take the covenant. From Cambridge he retired to France, where he embraced the Roman Catholic religion, not, as has been imputed to him, from sordid motives, as his distressed circumstances shortly after abundantly proved. By Cowley he was recommended to Henrietta Maria, who gave him letters of introduction to her friends at Rome, where he first acted as private secretary to a cardinal, and afterwards obtained a canonry at Loretto. Here he died of a fever about the year 1650. As a poet Crashaw has much merit, though conceit and puerilities are too frequently mingled with his works. The subjects of his poems, of which a collection was made in 1646, were chiefly devotional. Of these some were selected and published, about twenty years ago, by Peregrine Phillips. They are still but little known; nevertheless, the name of Crashaw merits this short notice, for, however neglected in the present day, he was the companion of Selden, and the idol of Cowley; and he was, moreover, the author of the fine Latin epigram on the Marriage of Cana, which has not always been justly appropriated, and which concludes, "Nympha pudica deum visit et erubuit," "The modest water saw its God, and blushed." Biog. Brit.

CRASIS, in *Medicine*, a term used by the older writers, who adopted the humoral pathology, to denote the constitution or temperament of the blood, and other fluids. Thus, in those diseases, in which symptoms of what has been called putrescence appeared, as in scurvy, malignant fever, &c. the hæmorrhages and purple spots were said to shew a dissolved crasis of the blood. This morbid condition has also been termed *dyserafy*.

CRASIS, in *Grammar*, is a figure, whereby two different letters are either contracted into one long letter, or a diphthong. Such, e. g. is $\sigma\phi\iota\varsigma$ for $\sigma\phi\iota\omega\varsigma$; $\alpha\lambda\eta\theta\eta$ for $\alpha\lambda\eta\theta\epsilon\alpha$, &c. $\tau\upsilon\chi\eta\varsigma$ for $\tau\upsilon\chi\eta\omega\varsigma$, &c. where ι and α are contracted into ι ; ϵ and α into η ; and ϵ and \omicron into υ . See CONTRACTION.

CRASPEDARIA, from $\kappa\rho\alpha\sigma\pi\epsilon\delta\omicron\nu$, *fringe*, in *Zoology*, a genus of animalcules, without any visible limbs or tails; but with an apparent mouth, and a series of limbræ round it in the manner of a fringe.

Of this genus there are three species: 1. The *craspedarium* with a roundish body. 2. The *craspedarium* with an oval body. 3. The *craspedarium* with a cylindrical body. They are species of the *Vorticella* in the class of *Vermes Infusoria*. See VORTICELLA.

CRASPEDIA, in *Botany*, (from $\kappa\rho\alpha\sigma\pi\epsilon\delta\omicron\nu$, a *fringe*;) Schreb. 1350. Willd. 1574. Forst. Fl. 58. Class and order, *syngenesia polygamia segregata*.

Gen. Ch. *Cal.* common imbricated; proper perianth none. *Cor.* Florets in a few depressed bundles, tubular, hermaphrodite. *Stam.* Filaments five; anthers united in a hollow cylinder. *Pist.* — *Seeds* with a feathered down. *Receptacle* chaffy.

Sp. *C. uniflora*; Forst. Prod. 306. A native of New Zealand.

CRASPEDITES SINUS, in *Ancient Geography*, a gulf of Asia Minor, in Bithynia, according to Pliny; called the gulf of *Olbia* by Mela.

CRASPEDIUM, in *Botany*, Lour. Flor. Cochin. Class and order, *polyandria monogynia*.

Gen. Ch. *Cal.* five-leaved; leaves oval, acute. *Cor.* Petals five, wedge-shaped, with numerous linear segments; nectaries five, kidney-shaped, villous at the inner base of the petals. *Stam.* Filaments thirty, short, inserted into the receptacle. *Pist.* Germ superior; style tubular; stigma simple. *Peric.* Berry small, one-celled. *Seed* solitary.

Sp. *C.* —. A large tree. *Leaves* oval-oblong, cre-

nulate, acute. *Flowers* greenish-yellow, in terminal clustered spikes. A native of Cochinchina. It is very nearly allied to *clæocarpus*, and perhaps ought to be referred to that genus.

CRASSAMENTUM of the *Blood*, in *Anatomy*, is one of the two parts into which blood, when left to itself, always separates. This crassamentum, which is also called *cruur*, consists of the coagulating lymph and the red globules. See BLOOD.

CRASSINA, in *Botany*. See ZIMMIA.

CRASSIROSTRÆ, in *Ornithology*, the name of a genus of small birds, distinguished by the thickness of their beaks; as the sparrow, greenfinch, and the like.

CRASSULA, in *Botany*, (a diminutive of *crassus*, thick; alluding to the fleshiiness of the leaves.) Linn. Gen. 392. Schreb. 533. Willd. 594. Juss. 207. Vent. 3. 273. Class and order, *pentandria pentagynia*. Nat. Ord. *Succulentæ*, Linn. Vent. *Sempervivæ*, Juss.

Gen. Ch. *Cal.* Perianth one-leaved, five-cleft; segments lanceolate, erect, acute, permanent. *Cor.* Petals five, generally narrowed into erect claws, which are sometimes connivent near the base, so as to have the appearance of a tube, with a border consisting of five oval or lanceolate segments, and generally expanding. *Stam.* Filaments five, inserted at the base of each petal; anthers roundish. *Pist.* Germs five, superior, oblong, acute, with a small emarginate nectariferous scale at the base of each; styles the length of the stamens; stigmas obtuse. *Peric.* Capsules five, erect, oblong, acuminate, compressed, opening longitudinally at their interior side. *Seeds* small, numerous.

Eff. Ch. Calyx one-leaved, five-cleft. Petals five; nectareous scales five, at the base of the germ. Capsules five. Seeds numerous. It differs from *sedum* chiefly in the number of stamens.

* *Shrubby*.

Sp. 1. *C. coccinea*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Bot. Mag. 495. (Cotyledon; Comm. Rar. 24. tab. 24. Bradl. Succ. 5. 7. tab. 5. Breyn. Prod. 3. 30. tab. 20. fig. 1.) "Leaves egg-shaped, flat, cartilaginous-ciliated, connate-sheathing at the base." *Stem* from one to three feet high, reddish, erect, cylindrical, branched. *Leaves* covering the stem almost from the bottom, opposite crosswise, so close together that they appear imbricated in four rows. *Flowers* scarlet, large, tubular, in a terminal umbel or fascicle; claws of the petals linear, closely connivent, and forming a tube at least an inch long; segments of the calyx erect, linear-lanceolate, acute, slightly ciliated or toothed like the leaves. A native of Africa. 2. *C. capitata*. Lam. 5. "Leaves linear, acute, cartilaginous-ciliated, connate-sheathing; heads of flowers generally three, clustered, terminal." *Stem* six or seven inches high, woody; branches numerous, erect, simple, leafy, almost smooth, channelled on two opposite sides, with a few short hairs at the edges of the channels. *Leaves* six or seven lines long, opposite, acute, flat or a little concave above, smooth, appearing jointed at the sheath, which remains after they are fallen off. *Flowers* in two or three small clustered heads at the extremity of each branch; petals narrow, almost linear in their upper part. A native of the Cape of Good Hope, described from a dried specimen communicated by Sonnerat. 3. *C. flava*. Linn. Mant. 60. Mart. 3. Lam. 2. Willd. 3. Burm. Afr. 37. tab. 23. fig. 2. (*Sedum africanum umbellatum*; Pluk. Alm. 340. tab. 314. fig. 2.) "Leaves flat, connate-perfoliate, even-surfaced; flowers corymbose-panicled." β . Pluk. Alm. 340. tab. 314. fig. 3. "Leaves cartilaginous-crenulated." *Stem* six or seven inches high, erect,

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erect, cylindrical' with two or three branches near the top, entirely covered with leaves except near the bottom, where the remaining sheaths of the leaves give it the appearance of being jointed. *Leaves* nearly an inch and half long, lanceolate, very acute, erect, in pairs. *Flowers* yellowish, erect, peduncled, clustered, in a branched terminal corymb; petals erect, lanceolate, a little longer than the calyx, very acute. A native of the Cape of Good Hope. 4. *C. pubescens*. Linn. jun. 190. Mart. 46. Willd. 4. Thunb. Prod. 55. "Leaves connate, egg-shaped, acute, villous; stem branched; flowers in a corymb." *Stem* about seven inches high, red, filiform, erect, smooth, branched; branches somewhat whorled, in threes, subdivided, pubescent. *Leaves* thick, spreading, the length of the internodes, flattish above, gibbous underneath. *Corymb* compound, trichotomous. A native of the Cape of Good Hope. 5. *C. pruinosa*. Linn. Mant. 60. Mart. 4. Lam. 3. Willd. 5. "Stem dichotomous; leaves awl-shaped, frosted-scabrous; flowers somewhat corymbed." A foot high. Whole plant covered with the appearance of a crystalline hoar-frost; small branches cylindrical, blood-red. *Leaves* opposite, fleshy, flat above, the length of the internodes, slightly connate. *Corymbs* terminal, unequal, small; petals white, lanceolate, spreading. A native of the Cape of Good Hope. 6. *C. scabra*. Linn. Sp. Pl. 14. Mart. 5. Lam. 4. Willd. 6. Dill. Elth. 177. tab. 99. fig. 117. (Cotyledon; Mart. Cent. 24. tab. 24.) "Leaves opposite, spreading, connate, scabrous, ciliated; stem scabrous, with cartilaginous asperities pointing downwards." The habit of a mesembryanthemum. *Leaves* oblong, acute. *Flowers* yellowish-green, in a terminal cyme; anthers saffron-coloured; filaments white. A native of the Cape of Good Hope. 7. *C. vestita*. Linn. jun. Supp. 188. Mart. 31. Willd. 8. Thunb. Prod. 8. "Leaves connate, deltoid, obtuse; stem covered with leaves; flowers terminal, in a head." *Root* spindle-shaped, creeping. *Stem* three inches high, almost upright, naked at the base, branched; branches and branchlets alternately scattered. *Leaves* very gibbous underneath, quite entire, covered with a white meal, sprinkled with minute green spots, imbricated in four rows. *Flowers* yellowish, sessile. A native of the Cape of Good Hope. 8. *C. coralina*. Linn. jun. Supp. 188. Mart. 32. Willd. 7. Thunb. Prod. 56. "Leaves connate, deltoid, obtuse; stem covered with leaves; flowers in an umbel." *Root* spindle-shaped. *Stems* several, dichotomously branched, erect; branches alternate, erect, divided, fastigiate. *Leaves* entire, green at the base, mealy at the tip, with impressed greenish dots, in four rows, longer than the internodes. *Flowers* numerous, terminal; peduncles filiform, smooth, one-flowered, scarcely longer than the leaves. This and the preceding resemble sea corallines in the curious structure of their leaves. 9. *C. argentea*. Linn. jun. Supp. 188. Mart. 30. Willd. 9. Thunb. Prod. 56. "Leaves connate, egg-shaped, entire, silvery; stem covered with leaves; corymb supradecom-pound." *Stem* a foot high or more; branches cylindrical, smooth. *Leaves* fleshy, blunt with a point, sharp-edged. A native of the Cape of Good Hope. 10. *C. fascicularis*. Lam. 6. "Leaves linear-lanceolate, cartilaginous-ciliated, sheathing at the base; flowers fascicled, tubular, sessile; border small, spreading." *Leaves* three lines long, erect, connate by pairs, with a remarkable sheath at their base. *Flowers* nearly resembling those of *crassula coccinea*, but a little smaller, eight or ten together in a sessile terminal fascicle, furrounded by lanceolate ciliated bractes; claws of the petals linear, forming a tube; calyx half the length of the corolla; segments lanceolate, acute, ciliated. A native of the Cape of Good Hope, found by Sonnerat. 11. *C.*

perfoliata. Linn. Sp. Pl. 2. Mart. 6. Lam. 7. Willd. 10. Dill. Elth. 114. tab. 96. fig. 113. (Aloe; Comm. Prælec. 74. tab. 23.) "Leaves lanceolate-awl-shaped, sessile, connate, channelled, convex underneath." *Stem* three feet high and more; Lam. (ten or twelve feet high, if it be not broken or injured; but it is weak and requires support; Mill.) glaucous, leafy, nearly simple. *Leaves* from three to five inches long, an inch and half broad at the base, glaucous, rather stiff, spreading. *Flowers* greenish-white, in large terminal clusters on a common thickish peduncle, which is four inches long and divided into several short ramifications; petals oblong, obtuse, with claws forming a short tube. A native of Africa. 12. *C. perforata*. Linn. jun. Supp. 190. Mart. 51. Lam. 33. Willd. 11. Thunb. Prod. 56. "Leaves opposite-perfoliate, egg-shaped; stem simple; flowers peduncled, somewhat whorled." *Stems* a foot and half high, cylindrical, red, rather naked. *Leaves* somewhat acute, entire, even-surfaced. *Flowers* in a long terminal raceme, small, clustered, on opposite common peduncles. A native of the Cape of Good Hope. 13. *C. fruticulosa*. Linn. Man. 60. Mart. 7. Lam. 8. Willd. 12. "Leaves opposite, awl-shaped, acute, spreading, a little recurved." β . *C. caffra*; Linn. Mant. 222. *Stem* a foot high, somewhat branched, the thickness of a finger, sometimes throwing out lateral roots. *Leaves* sessile, cylindrical, even-surfaced. *Flowers* white, small; peduncles terminal, filiform, much longer than the leaves, furnished with a pair or two of bractes, nearly forming an umbel; calyx erect, half the length of the corolla; petals oblong-egg-shaped, without claws, concave, acute; anthers blood-red or brown; germs white, scabrous. A native of the Cape of Good Hope. 14. *C. ramosa*. Mart. 9. Willd. 13. Thunb. Prod. 55. Hort. Kew. 1. 390. (*C. dichotoma*; Linn. jun. 188.) "Leaves awl-shaped, flat above, connate-perfoliate, even-surfaced, very widely spreading; peduncles elongated; flowers in cymes." *Stem* a foot high, filiform, smooth, leafy, branched at the bottom; branches alternate, long, smooth, rufescent. *Leaves* longer than the internodes, entire, smooth. A native of the Cape of Good Hope. 15. *C. mollis*. Linn. jun. Supp. 189. Mart. 37. Willd. 14. Thunb. Prod. 55. Hort. Kew. 1. 391. "Leaves semi-cylindrical, acute, gibbous underneath, even-surfaced, nearly erect; cymes terminal, compound." *Stem* a foot high, almost the thickness of a goose-quill, angular, jointed, rufescent, very finely tomentous. *Leaves* acute, smooth or very finely tomentous, soft, spreading. A native of the Cape of Good Hope. 16. *C. tetragona*. Linn. Sp. Pl. 4. Mart. 8. Lam. 9. Willd. 15. (Cotyledonoides; Bradl. Succ. 5. 18. tab. 11. fig. 41.) "Leaves awl-shaped, somewhat incurved, obsoletely tetragonal, spreading; stem erect, throwing out lateral roots." *Stem* arborescent, two or three feet high, erect, even-surfaced, reddish, branched. *Leaves* longer than the internodes, about the thickness of a goose-quill, acute, green, smooth, opposite in cross pairs so as to form four very regular rows. *Flowers* very small, white, in a terminal trisid much branched cyme; common peduncle slender, naked; anthers purplish. A native of Africa. 17. *C. muricata*. Willd. 16. Thunb. Prod. 55. "Leaves connate, three-sided, ciliate-scabrous; branches tetragonal." A native of the Cape of Good Hope. 18. *C. imbricata*. Mart. 55. Willd. 17. Hort. Kew. 1. 393. "Leaves egg-shaped, acute, even-surfaced, imbricated in four rows; flowers axillary, sessile." A native of the Cape of Good Hope. 19. *C. cultrata*. Linn. Sp. Pl. 9. Mart. 11. Lam. 11. Willd. 19. (*C. auacampferotis* toliio; Dill. Elth. 115. tab. 97. fig. 114.) "Leaves opposite, connate, inversely egg-shaped, rather sharp at the edges, oblique,

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oblique, quite entire." *Stems* cylindrical, a foot high or more, leafy on the upper part, a little branched, weak, inclining or procumbent unless supported. *Leaves* in distant pairs, about an inch and half long, and nine lines broad, fleshy, almost flat, narrowed at the base, green, smooth. *Flowers* in an oblong panicle, small, greenish-white, never expanding; common peduncle rather long, cylindrical, almost naked; petals ending in a remarkable point. A native of Africa. 20. *C. ovalata*. Linn. Mant. 61. Mart. 10. Lam. 10. Willd. 18. Thunb. Prod. 56. "Leaves opposite, somewhat lanceolate, sharp-edged, approximate." Similar to the preceding in the sharp edges of its leaves and the character of its flowers, but it has a shorter stem, and its leaves are nearer together. *Stem* three or four inches high, closely branched from the base. *Leaves* near two inches long, five or six inches broad, a little convex underneath. A native of the Cape of Good Hope. 21. *C. portulacæa*. Lam. 12. "Leaves oval, fleshy, resembling those of purslane, opposite; stem arboreous, very thick." The habit of portulacaria afra (*crassula portulacaria*: Linn.), but is much larger, and has not obtuse leaves. *Stem* four feet high, thicker than a man's arm towards the base; branches cylindrical, fleshy, smooth, paniced, leafy. *Leaves* about an inch and half long, an inch broad, rather acute, somewhat sharp at the edges, a little shining yellowish-green. *Flowers* rather large, pale rose-coloured, in a terminal peduncled cyme or umbel; calyx short; petals narrow, linear-lanceolate, expanding; germs scabrous. A native of Africa. 22. *C. obliqua*. Mart. 56. Willd. 20. Hort. Kew. 393. (*C. ovata*; Mill.) "Leaves opposite, egg-shaped, oblique, quite entire, acute, distinct, somewhat cartilaginous at the edge." *Stem* near three feet high, much branched. *Leaves* of a lively green, half embracing the stem. A native of the Cape of Good Hope. 23. *C. spatulata*. Mart. 60. Willd. 21. Thunb. Prod. 57. Hort. Kew. 1. 395. "Leaves petioled, cordate-rounclish, rather acute, crenate; corymbs forming a panicle." A native of the Cape of Good Hope. 24. *C. cotyledon*. Tree crassula. Lam. 13. Jacq. Misc. 2. 295. tab. 19. Bot. Mag. 384. (*C. arborescens*; Willd. 26. Mill.) "Leaves roundish, fleshy, dotted above; stem arboreous." The habit of cotyledon orbiculata. *Stem* two feet high or more, very thick, erect, branched near the top; branches greyish or reddish, cylindrical, fleshy, smooth, leafy. *Leaves* opposite, glaucous with purple edges, a little convex underneath, more than an inch and half in diameter. *Flowers* reddish-white, in a terminal paniced cyme; some of them are quadrifid. A native of Africa. A singularity of this species is its indisposition to flower. Mr. Fairbairn informed the late Mr. Curtis, that he never saw it produce blossoms in Chelsea garden till the summer of 1797. Mr. Miller never saw it in flower; nor does it appear that the late Mr. Aiton ever did. Bot. Mag. 25. *C. punctata*. Linn. Sp. Pl. 14. Mart. 20. Willd. 22. (*C. perfolia*; Lam. 14?) "Leaves opposite, egg-shaped, dotted, ciliated; lower ones oblong." Linn. "Leaves connate-perfoliate, approximate, heart-shaped, dotted, quite smooth, purple at the edges." Lam. *Stem* cylindrical, even-surfaced, simple. *Leaves* opposite, in two rows, oblong, sessile, fleshy, sprinkled with concave dots, convex underneath, very tenderly ciliated; floral leaves egg-shaped. *Corymbs* axillary, very short, fastigiate. *Corollas* campanulate, white, with a reflexed border; anthers purple. Linn. La Marck doubts whether Linnæus saw his plant, because he makes no mention of the very peculiar growth of its leaves, and moreover describes those of his *punctata* as ciliated, growing in two rows, with the lower ones oblong; characters which he himself has not found. He gives the

following description of his *perfolia*. *Stem* from six to ten inches long, slender, feeble, unable to support itself on account of the weight of the leaves, cylindrical, hard, smooth, simple. *Leaves* almost heart-shaped, so connate that each pair seems to be only a single elliptical leaf, a little pointed at each end, slightly concave and dotted above, somewhat convex underneath, glaucous, with a very smooth purple border. These leaves, or pairs of leaves, are placed very near together, and seem strung on the stem, which runs through their centre in the manner of an axis; the lower ones are the smallest. A native of Africa, cultivated in the botanic garden at Paris, 26. *C. lycopodioides*. Lam. 15. (*C. pyramidalis*; Linn. jun. Mart. 40. Willd. 38?) "Leaves small, ovate-acute, margined, imbricated in four rows, entirely covering the stem and branches." Lam. "Leaves connate, egg-shaped, obtuse, in four rows, incumbent; heads of flowers sessile." Linn. jun. *Stems* from seven to ten inches high, the thickness of a goose-quill, somewhat branched, rather stiff. *Leaves* convex at the back, a little flattened at the sides so as to produce the appearance of a border, sessile, fleshy, green. In habit rather resembling a lycopodium than a crassula. Lam. A native of Africa. 27. *C. marginalis*. Mart. 61. Willd. 23. Hort. Kew. 1. 396. "Leaves heart-shaped, perfoliate, acuminate, flat, spreading, dotted within the margin." A native of the Cape of Good Hope. 28. *C. laëta*. Mart. 62. Willd. 25. Hort. Kew. 1. 496. Smith Exot. Bot. tab. 33. "Leaves egg-shaped, attenuated at the base, connate, quite entire, with a row of dots within the margin; cymes paniced." Whole plant smooth. *Stem* much branched, cylindrical, leafy. *Leaves* crowded, crossing each other in pairs, thick, pointed. *Flowers* white, in a terminal panicle; anthers rose-coloured; scales at the base of the germ scarcely perceptible; petals, filaments, and germs often six. Dr. Smith. A native of the Cape of Good Hope. 29. *C. cordata*. Linn. jun. Supp. 189. Mart. 35. Willd. 34. Hort. Kew. 1. 396. "Leaves petioled, heart-shaped, obtuse, quite entire; cymes paniced." A native of the Cape of Good Hope. 30. *C. rupestris*. Linn. jun. Supp. 389. Mart. 43. Willd. 27. Thunb. Prod. 56. "Leaves connate, egg-shaped, entire, smooth; corymb supra-decompound." *Stem* three inches high or more, cylindrical, branched. *Leaves* alternately opposite, acute, a little concave above, convex, and keeled underneath, approximating, longer than the internodes, green, with a reddish margin. *Flowers* in trichotomous fastigiate corymbs; peduncles and pedicels smooth, white, tinged with purple; bracte minute, white, egg-shaped under each pedicel. A native of the Cape of Good Hope. 31. *C. lucida*. Lam. 16. "Leaves opposite, petioled, somewhat heart-shaped, finely crenate, shining above; stems branched, weak." *Stem* sometimes a foot long, smooth; upper part of the branches green, and somewhat herbaceous. *Leaves* seldom more than six lines broad, fleshy, flat above, with a slight furrow, which is continued along the petiole, bright green. *Flowers* white within, purplish on the outside, small, expanding, in a peduncled nearly terminal cyme; petals narrow, acute, much longer than the calyx. A native of Africa. 32. *C. pinnata*. Linn. jun. Supp. 151. Mart. 13. Lam. 17. Willd. 28. Lour. Cochin. 131. "Leaves pinnated; stem arboreous." *Stem* rufescent, even-surfaced, with alternate branches. *Leaves* alternate, unequally pinnated; leaflets seven or nine, petioled, heart-shaped, quite entire, acute, even-surfaced; petioles thickest at the base. *Flowers* red, in an axillary panicle, shorter than the leaves. A native of China.

* Herbaceous.

33. *C. retroflexa*. Linn. jun. Supp. 188. Mart. 33. Willd. 30. Thunb. Prod. 55. "Leaves connate, oblong, remote, flat; stem simple; cyme compound; pedicels bent back." *Root* annual. *Stem* a finger's length, filiform, zig-zag, erect, smooth, purple. *Stem-leaves* two or four, obtuse, spreading. It varies with orange-coloured, yellow, and white flowers. 34. *C. lineolata*. Mart. 53. Willd. 31. Hort. Kew. 1. 331. "Leaves heart-shaped, sessile; peduncles nearly terminal, axillary, approximating, forming an umbel." *Root* biennial. 35. *C. centauroides*. Linn. Sp. Pl. 5. Mart. 14. Lam. 18. Willd. 32. (Sedivides, Herm. Par. 169.) "Stem dichotomous; leaves sessile, oblong-ovate, heart-shaped, flat; peduncles axillary, one-flowered." *Root* annual or biennial. *Stem* three or four inches high, nearly cylindrical, brachiate, somewhat pubescent. *Leaves* often opposite, fleshy, acute, shining, marked with hollow dots. *Flowers* yellowish-red. A native of Africa. 36. *C. dichotoma*. Linn. Sp. Pl. 6. Mart. 15. Lam. 19. Willd. 33. (Sedum; Herm. Lugbd. 550. tab. 553.) "Stem dichotomous; leaves sessile, ovate-oblong, channelled, recurved; peduncles axillary, one-flowered." Nearly allied to the preceding; but its leaves are smaller, and its flowers larger. *Root* annual. *Stem* four or five inches high, slender, cylindrical, pale green, branched, and dichotomous near the top. *Leaves* opposite. *Flowers* purple on the outside, yellow within; each petal marked at the bottom with a blood-red, heart-shaped spot. A native of Africa. 37. *C. glomerata*. Linn. Mant. 60. Mart. 16. Lam. 20. Willd. 34. "Stem dichotomous; leaves lanceolate; last flowers fascicled." *Root* annual. *Stem* three inches high, slender as a thread, reddish, very dichotomous, and forming a tuft with its branches. *Leaves* opposite, sessile, green, somewhat fleshy, expanding, shorter than the internodes. *Flowers* sessile; some almost sessile in the forks of the stem; others clustered, two or three together at the end of the branches; bracts and divisions of the calyx hispid, with short hairs near the summit; petals white, much shorter than the calyx. A native of the Cape of Good Hope. 38. *C. pulchella*. Mart. 54. Willd. 35. Hort. Kew. 1. 392. "Stem dichotomous; leaves ovate-oblong, fleshy, reflexed; flowers in the forks peduncled; peduncles top-shaped." *Root* annual. Nearly allied to the preceding, but differing in having its leaves shorter and reflexed; its peduncles top-shaped, so as to look like an inferior germ; its calyxes obtuse, and its corollas rather longer than their calyx. A native of the Cape of Good Hope. 39. *C. strigosa*. Linn. Sp. Pl. 7. Mart. 17. Lam. 21. Willd. 36. "Stem dichotomous, erect; leaves inversely egg-shaped, bristly; peduncles one-flowered." *Root* annual. *Stem* six or seven inches high. *Leaves* opposite, somewhat fleshy, quite entire; lower ones peduncled. *Flowers* several together, terminal; petals the length of the calyx. 40. *C. muscosa*. Linn. Sp. Pl. 8. Mart. 18. Lam. 22. Willd. 37. "Stem prostrate; leaves opposite, egg-shaped, gibbous, imbricated; flowers sessile, solitary." *Root* annual. *Stems* filiform, seldom branched, covered with leaves. *Leaves* small, sessile. *Flowers* very small, axillary. A native of Africa. 41. *C. columnaris*. Linn. jun. Supp. 191. Mart. 28. Lam. 34. Willd. 39. (Euphorbinum; Burm. Afr. 19. t. b. 9. fig. 2.) "Stem an inch high; leaves round, imbricated; fascicle roundish, terminal." *Stem* thick, cylindrical, smooth. *Leaves* obtuse, horizontal. *Flowers* white, numerous; divisions of the border linear, spreading. A native of the Cape of Good Hope. 42. *C. hemispherica*. Willd. 40. Thunb. Prod. 57. "Leaves

ovate, roundish, ciliated, hemispherically imbricated; stem without leaves; flowers in a thyrse." *Root* annual. A native of the Cape of Good Hope. 43. *C. alfoides*. Mart. 57. Willd. 41. Hort. Kew. 1. 394. "Leaves egg-shaped, distinct, acute, ciliated; stem simple, a little hairy; raceme compound; branches panicled." *Root* biennial. *Stem* about six inches high. *Leaves* fleshy, smooth; sprinkled with minute, red, impressed dots. *Flowers* in a terminal raceme; peduncles distant, spreading, subdivided into trichotomous cymes; divisions of the calyx smooth, a line long; petals white, greenish underneath, twice the length of the calyx; nectaries yellow; filaments white; anthers small, roundish. A native of the Cape of Good Hope. 44. *C. capitella*. Linn. jun. Supp. 190. Mart. 45. Willd. 42. Hort. Kew. 1. 394. "Leaves oblong-lanceolate, acute, connate, ciliated; stem even-surfaced; raceme elongated; flowers fascicled, nearly sessile. *Root* biennial. *Stem* seven inches high, erect, cylindrical, smooth, sometimes branched at the top. *Leaves* remote, longer than the internodes, smooth. *Flowers* white. A native of the Cape of Good Hope. 45. *C. cotyledonis*. Linn. jun. Supp. 19. Mart. 49. Willd. 43. Thunb. Prod. 56. "Leaves connate, oblong, tomentous, ciliated; stem almost leafless; flowers in corymbs, aggregate. *Stem* simple, erect, slightly quadrangular, about a foot high, the thickness of a quill. *Root-leaves* fastigiate opposite, much crowded, obtuse, flat above, convex beneath, entire, a finger's length, erect; stem leaves in three pairs, smaller. *Flowers* white, pedicelled; peduncles trichotomous, forming a decomposed corymb; bracts on the peduncles, fastigiate opposite, connate-sheathing, egg-shaped, obtuse, pressed close, tomentous. A native of the Cape of Good Hope. 46. *C. barbata*. Linn. jun. Supp. 188. Mart. 29. Willd. 44. Thunb. Prod. 46. "Leaves connate, jointed, bearded, hemispherically imbricated; stem nearly cylindrical; flowers in whorls." *Root* biennial. *Stem* about seven inches high, nearly the thickness of a quill, erect, smooth. *Root-leaves* numerous, aggregate, thin, smooth, with bundles of hair at the edge; stem-leaves in two pairs, remote. A native of the Cape of Good Hope. 47. *C. ciliata*. Linn. Sp. Pl. 10. Mart. 19. Lam. 23. Willd. 43. Dill. Elth. 116. tab. 98. fig. 116. "Leaves opposite, oval, flattish, distinct, ciliated; corymbs terminal." *Root* perennial, slender, fibrous. *Stem* short, divided into several leafy branches, some of which are lengthened into slender cylindrical shoots, nine or ten inches long. *Leaves* obtuse, green, and smooth on both sides, thickly fringed with white hairs. *Flowers* small, yellow, collected into two or three small terminal corymbs. A native of Africa. 48. *C. gentianoides*. Lam. 24. (Gentianella Africana, Pluk. Mant. 89. tab. 415. fig. 6.) "Leaves opposite, ovate-acute, smooth; stem simple, dichotomous near the top; peduncles trichotomous." *Root* fibrous. *Stem* two or three inches long, slender. *Leaves* in about three pairs, oval, a little pointed, concave above, succulent, quite smooth. *Flowers* pale blue, large for the size of the plant, in an umbellated terminal cyme; bracts in pairs, at the foot of the peduncles, small, narrow; corolla monopetalous, campanulate, divided more than half way down; segments narrowed at the base, oval upwards. A native of Africa, communicated to La Marek by Sonnerat. *Olif.* It has the corolla of a cotyledon, and the number of stamens of a crassula. 49. *C. thyrsoflora*. Linn. jun. Supp. 190. Mart. 44. Willd. 46. Thunb. Prod. 55. "Leaves perfoliate, egg-shaped, ciliated, spreading; corymb compound, attenuated." *Stem* about six inches high, erect, cylindrical, smooth. *Leaves* obtuse, shorter than the internodes, smooth. *Flowers* white; bracts at the foot of the peduncles

duncles and pedicels, like the leaves, but smaller. A native of the Cape of Good Hope. 50. *C. umbella*. Mart. 64. Jacq. Collec. iv. 172. Icon. Rat. 2. "Leaves perfoliate, roundish; racemes axillary and terminal; upper peduncles in whorls. *Root* perennial. Whole plant smooth. *Stem* one or two, about seven inches high, the thickness of a quill, nearly erect, cylindrical, fleshy, pale flesh-coloured, almost pellucid, simple. *Root-leaves* none; stem-leaves two, sometimes only one, the largest three inches in diameter, convex, repand, brittle, green, with pale rays above, red-purple underneath. *Racemes* to each leaf two, erect, slender, opposite, from an inch to two inches long. *Flowers* white within, flesh-coloured without, small, most commonly with six stamens and six styles. A native of the Cape of Good Hope. 51. *C. spicata*. Linn. jun. Supp. 189. Mart. 41. Willd. 47. Thunb. Prod. 55. "Leaves connate, linear-awl-shaped; stem nearly leafless; spike whorled; lower whorls more remote." *Stem* about six inches high, cylindrical, erect, smooth. *Root-leaves* a finger's length, erect, concave above, convex underneath, smooth, much crowded; stem-leaves opposite, smaller. *Flowers* sessile. A native of the Cape of Good Hope. 52. *C. cymosa*. Linn. Mant. 222. Mart. 2. Lam. 35. Willd. 2. Berg. 84. (*Spiræa capensis*, Pet. Gaz. tab. 89. fig. 6.) "Leaves connate-sheathing, linear, cartilaginous-ciliated; cyme compound, terminal." *Root* perennial. *Stems* herbaceous, about seven inches high, simple, erect, smooth. *Leaves* two inches long, acute, spreading, smooth on both sides. *Cyme* small, dense, bifid, scaly. A native of Africa. La Marck supposes that his capitata (N^o 2.) is nearly allied to this species, but it differs in having a woody perennial stem. 53. *C. subulata*. Linn. Sp. Pl. 3. Mart. 21. Lam. 25. Willd. 48. Berg. 83. (*Spiræa*, Pet. Gaz. tab. 89. fig. 8. *Sedum*, Herm. Lugdb. 550. tab. 552.) "Leaves awl-shaped, cylindrical, spreading." *Stem* six or seven inches high, erect, with two or three branches, entirely covered with truncated ciliated sheaths of the leaves. *Leaves* about an inch long, opposite, linear, fleshy, obtuse, flat above and below, fringed with cartilaginous cilia. *Flowers* white (scarlet, Berg.), in a terminal nearly sessile head, with a many-leaved imbricated involucre. A native of the Cape of Good Hope. 54. *C. acutifolia*. Lam. 26. "Leaves opposite, fleshy, cylindrical-awl-shaped, quite smooth, spreading; cyme small, peduncled." *Root* perennial. *Stems* three inches long, cylindrical, leafy, a little branched. *Leaves* a little connate, not sheathing, six or seven lines long. *Flowers* white, from twelve to eighteen in a very small, often dichotomous cyme; common peduncle two inches long, lateral, almost naked. A native of Africa. 55. *C. alternifolia*. Linn. Sp. Pl. 12. Mart. 22. Lam. 27. Willd. 49. Burm. afr. 53. tab. 24. fig. 1. (*Cotyledon flore luteo, media*; Herm. Lugdb. 191.) "Leaves serrate-toothed, flat, alternate; stems quite simple; flowers pendulous." *Stems* several, two feet long, purple, hairy. *Leaves* oval-lanceolate, with a very long point, sessile. *Flowers* yellow, axillary, solitary, on short peduncles. A native of Africa. 56. *C. rubens*. Mart. 23. Lam. 28. Willd. 50. (*Sedum rubens*; Linn. Sp. Pl.) "Leaves scattered, semi-cylindrical, smooth; flowers lateral, solitary, nearly sessile; branches villous." *Root* annual. *Stem* about three inches high, cylindrical, a little villous, reddish, simple below, branched near the top. *Leaves* sessile, a little attenuated and red near the tip; lower ones an inch long. *Flowers* white, with a purple longitudinal line on the outside segments of the calyx, fleshy, convex on the outside, slightly villous; petals three times as long as the calyx; nectaries white, very small; stamens generally observed to be five; but

Haller asserts that these are naturally ten, five of them soon withering. *Fruit* stellate, red; capsules armed with the permanent style. It has the habit of a sedum, and perhaps might with more propriety have been left where Linæus and the older botanists placed it. A native of the south of Europe. 57. *C. cespitosa*. Willd. 51. Cavan. ic. 1. 50. tab. 69. fig. 2. "Leaves globular-egg shaped, imbricated; flowers terminal, sessile. *Stem* somewhat divided." *Root* annual. *Stem* three lines long. *Flowers* solitary, or three together. A native of Spain. 58. *C. minima*. Willd. 52. Thunb. Prod. 57. "Leaves petioled, roundish, entire; peduncles one flowered." A native of the Cape of Good Hope. 59. *C. meschata*. Willd. 53. Forst. Comment. Geett. 9. 26. "Stem procumbent; leaves connate, oblong, acute; peduncles axillary, one-flowered; flowers tetrandrous." It differs from tillæa in the nectary, though it agrees in the number of parts. 60. *C. verticillaris*. Linn. Mant. 261. Mart. 24. Lam. 29. Willd. 54. (*Tillæa erecta*; Hort. Ups. 24.) "Leaves spreading; flowers in whorls, awned." *Root* annual. *Stem* the length of a finger, much branched, diffuse; branches opposite. *Leaves* opposite, crowded, oblong-egg-shaped, sessile, gibbous, sprinkled with minute pimples, scabrous at the tip. *Flowers* axillary, sessile, very minute; calyx the length of the corolla, awl-shaped; petals shorter than the calyx, lanceolate, acuminate so as to be almost awned, red in the middle; stamens very short, red at the tip; stigmas red. A native of the south of Europe. 61. *C. expansa*. Mart. 52. Willd. 55. Hort. Kew. 1. 390. "Leaves semi-cylindrical-awl-shaped, spreading; peduncles axillary, solitary, one-flowered; stems dichotomous." *Root* annual. A native of the Cape of Good Hope. 62. *C. dentata*. Willd. 56. Thunb. Prod. 57. "Leaves petioled, heart-shaped, toothed." A native of the Cape of Good Hope. 63. *C. nudicaulis*. Linn. Sp. Pl. 13. Mart. 25. Lam. 30. Willd. 57. Dill. Elth. 116. tab. 99. fig. 115. "Leaves awl-shaped, radical; stem naked." *Root* perennial, branched. *Leaves* three inches long or more, numerous, linear narrow, pale green, succulent, almost semi-cylindrical, making a kind of head on the ground. *Stem* or scape six inches high or more, with two or three joints, and three or four bractes in a whorl at each joint. *Flowers* greenish, not expanding, in several compact heads, some of which are terminal, and others a little below, almost in a whorl. A native of Africa. 64. *C. teza*. Linn. jun. Supp. 190. Mart. 50. Willd. 58. Thunb. Prod. 56. "Leaves connate, egg-shaped, obtuse, cinereous-lamellated; scape naked; head terminal." *Stem* scarcely any. *Leaves* nearly radical, very abundant, imbricated, concave above, convex underneath, thick, covered with an ash-coloured meal resembling the scales of a butterfly's wing, naked at the base, cartilaginous-ciliated. *Scape* erect, filiform. *Flowers* minute, collected into a head. A native of the Cape of Good Hope. 65. *C. cephalophora*. Linn. jun. Supp. 190. Mart. 47. Willd. 59. Thunb. Prod. 56. "Leaves connate, linear-oblong, obtuse, entire; heads of flowers lateral, peduncled." *Root-leaves* the length of a finger, erect, somewhat tomentous; stem-leaves none. *Scape* six or seven inches high, erect, cylindrical, somewhat tomentous. *Heads* of flowers opposite, the size of a pea. A native of the Cape of Good Hope. 66. *C. montana*. Linn. jun. Supp. 189. Mart. 36. Willd. 60. Thunb. Prod. 55. "Leaves connate, egg-shaped, acute, ciliated; stem nearly naked; flowers aggregate." *Stem* the length of a finger, erect, filiform, purple. *Root-leaves* numerous, spreading, concave, smooth, green tinged with purple; stem-leaves in about three remote pairs. *Flowers* sessile, in heads usually

solitary, sometimes in two lateral ones together. A native of the Cape of Good Hope. 67. *C. turrita*. Linn. jun. Supp. 189. Mart. 42. Willd. 61. Thunb. Prod. 55. "Leaves connate, imbricated in four rows, ovate-oblong, acute, ciliated." *Root* annual. *Stem* about three inches high, erect, weak, cylindrical, jointed, covered with leaves, smooth. *Leaves* alternately opposite, thick, smooth, red; lower ones oblong, concave above, convex underneath; upper ones egg-shaped, flat above. A native of the Cape of Good Hope. 68. *C. alpestris*. Linn. jun. Supp. 189. Mart. 39. Willd. 62. Thunb. Prod. 55. "Leaves connate, egg-shaped, acute, imbricated in four rows; heads of flowers peduncled; stem leafy." *Stem* three inches high, purple, erect, cylindrical, smooth, branched at the bottom, before flowering time entirely covered with leaves. *Leaves* concave, entire, purplish green. *Flowers* in several small terminal heads; peduncles purple. It resembles *C. montana*, but the leaves are more acuminate and not ciliated, the stem thicker and covered with leaves; the heads and flowers larger. A native of the Cape of Good Hope. 69. *C. marginata*. Willd. 63. Thunb. Prod. 55. "Leaves connate, egg-shaped, membranous at the edges; peduncles one-flowered; stem weak." A native of the Cape of Good Hope. 70. *C. tomentosa*. Linn. jun. Supp. 190. Mart. 48. Willd. 64. Thunb. Prod. 56. "Leaves connate, lanceolate, villous, ciliated; stem almost without leaves; flowers in whorls." *Stem* a foot high, erect, angular, villous. *Root-leaves* bluntnish, hirsute, imbricated; stem-leaves in three pairs, smaller. A native of the Cape of Good Hope. 71. *C. crenulata*. Linn. jun. Supp. 189. Mart. 38. Willd. 65. Thunb. Prod. 56. "Leaves connate, lanceolate, dotted and crenulated; stem leafy; corymb decomposed." *Stem* a foot high, erect, cylindrical, leafy, jointed, smooth, green variegated with white lines. *Leaves* sessile, obtuse, concave above, convex beneath, smooth, longer than the internodes, the length of a finger, upright, but spreading at the tip. *Flowers* white, in a trichotomous, fastigate corymb; bractes two under each pedicel, minute, opposite. A native of the Cape of Good Hope. 72. *C. deltoidea*. Linn. jun. Supp. 189. Mart. 34. Willd. 66. Thunb. Prod. 56. "Leaves connate, deltoid, spreading, acute; stem covered; flowers in a corymb." *Stem* fleshy, erect, cylindrical, naked at the bottom, leafy above, branched. *Leaves* alternately opposite, imbricated, spreading at the tip, entire, glaucous, mealy. *Corymb* terminal, compound, somewhat fastigate. The leaves resemble those of *mesembryanthemum deltoideum*. A native of the Cape of Good Hope. 73. *C. orbicularis*. Linn. Sp. Pl. 15. Mart. 26. Lam. 31. Willd. 67. Dill. clth. 119. tab. 100. fig. 118. "Runners prolific, regularly leafy at the end; leaves widely spreading, imbricated." *Root* perennial, producing laterally from its crown numerous filiform, procumbent, prolific runners. *Leaves* in regular rosaceous tufts proceeding from the original root and from the ends of the runners where they take fresh root and send out other runners, oval, or oval-oblong, rather acute, fleshy, edged with very fine cartilaginous cilia. *Scapae* four or five inches high, rising from the centre of the tufts of leaves, erect, furnished with two or three pair of very small bractes. *Flowers* small, whitish red, in several small clusters disposed in a short branched spike, sweet scented; petals the length of the calyx. A native of the Cape of Good Hope. 74. *C. sparsa*. Mart. 58. Willd. 68. Hort. Kew. 1. 395. "Leaves alternate, somewhat spatula-shaped, acute, quite entire; raceme compound." *Root* biennial. A native of the Cape of Good Hope. 75. *C. diffusa*. Mart. 59. Willd. 69. Hort. Kew.

1. 395. "Leaves oblong, attenuated at the base, remotely crenated; peduncles solitary, opposite to the leaves and axillary." *Root* annual. A native of the Cape of Good Hope. 76. *C. prostrata*. Willd. 70. Thunb. Prod. 54. "Decumbent, pellucid; leaves lanceolate, acute." A native of the Cape of Good Hope. 77. *C. pellucida*. Linn. 16. Mart. 27. Lam. 32. Willd. 71. Dill. clth. 119. tab. 100. fig. 119. "Stem flaccid, creeping; leaves opposite." *Root* perennial. The habit of a purslane. *Stems* from six inches to a foot long, putting out roots at the joints, red, almost transparent, slender, trailing, smooth. *Flowers* white, with a blush of purple at the edge, in small clusters at the ends of the branches. A native of Africa. Common in botanical collections in England and other parts of Europe.

Obf. Jussieu, disregarding the number of stamens, has referred all the tubular species to cotyledon.

CRASSULA decumbens, inanis, natans et umbellata; Thunb. See TILLÆA.

CRASSULA fruticosa; Mill. See OTHONNA tenuifolia.

CRASSULA portucalaria; Linn. See PORTULACARIA *Afra*.

Propagation and Culture.—Most of the species are hardy, and may be treated like the mesembryanthemums and other hardier kinds of succulent plants, but should not have much water: and some of them, particularly *C. coccinea*, and *C. perfoliata*, must not be so long exposed to the open air in summer, but removed early to a warm, dry glass case.

CRASSULA, in *Gardening*, comprises plants of the succulent kind for the green-house and stove collections. Of which the species cultivated are the scarlet flowered crassula (*C. coccinea*), the perfoliate shrubby crassula (*C. perfoliata*), the sharp leaved crassula (*C. cultrata*), the dotted leaved crassula (*C. punctata*), the naked stalked crassula (*C. nudicaulis*), hairy crassula (*C. orbicularis*). Besides which there are several other species that may be cultivated.

Method of Culture.—Of these plants the first three sorts are capable of being easily increased, by planting the cuttings of the stems and branches in the later spring and summer months. After having been exposed in a dry situation for a few days, to heal over the cut parts, in pots filled with sandy earth planting them in the bark-bed of the stove, or in a frame shaded from the sun. When well rooted, they should be removed into separate pots and be replaced in the same situation till fully established, when they may be removed into the green-house, where they should have a sunny situation in winter and but little water, as it is apt to destroy them.

The other sorts may be increased by planting the offsets from the roots in the same manner as directed above.

These being plants of a succulent nature in their stems, branches, and leaves, as well as curious in their growth, they afford much variety among collections of other plants of similar kinds. They are capable in dry warm situations of bearing the open air in the summer season.

CRASSUS, LUCIUS LICINIUS, in *Biography*, an eminent orator of Rome, born, B. C. about 140, was brought into notice principally by the part that he took in the impeachment of Papirius Carbo, which he managed with the utmost skill, displaying, in the pleadings, the most consummate eloquence. Crassus from this circumstance immediately rose to the highest reputation. At the age of 27 he defended the vestal virgin Licinia, accused of unchastity. He was the advocate of many very popular measures; and he passed with distinguished honour through all the principal offices

offices of the state. He died in the year B. C. 91, in consequence of some over-exertions in vindicating the senate from the censures passed upon it by the consul Philippus, who threatened to silence him: in reply to which the orator exclaimed; "If you would silence Crassus, you must cut out his tongue; and even then, liberty will inspire my breath itself to resist your tyranny." He perished in the contest, and carried his point, but the violence of his agitation brought on a pleurisy, of which he died, in a few days, to the great regret of his fellow-citizens, who considered him as a martyr to his country's cause. Cicero, in speaking of Crassus, says, "His language was accurate and elegant, without being too studied. He had wonderful clearness of argument and illustration, as well on subjects of civil law as of common equity. As Scævola was the most eloquent of lawyers, so Crassus was accounted the best lawyer among the eloquent. What is very difficult to attain, he was at the same time highly ornate, and very concise. He had no equal in attack or reply. He was conversant in almost all kinds of causes, and early took his station among the principal orators." Univer. Hist. Cicero.

CRASSUS, MARCUS LICINIUS, a distinguished Roman, who must hereafter be noticed in the article ROME, as taking a very leading part in her affairs in the latter days of the republic, but who nevertheless cannot be passed over in our biographical sketches. He was descended from a family of high rank; enjoyed all the advantages of a liberal education, and selected as his principal pursuits, oratory, history, and the philosophy of the age. His father and mother were slaughtered under the tyrannies of Marius and Cinna, and he himself escaped by leaving his country for Spain, where he was concealed in a cave for the space of eight months. On the death of Cinna, he joined Sylla, whom he served with zeal and fidelity. During the civil wars Crassus enriched himself by means not at all honourable. He was prætor, B. C. 71, and was appointed to the command of the army, in which office he exercised much severity against those who neglected to perform their duty. In the following year Crassus was associated with Pompey in the consulship. They had been long rivals, and were now exceedingly jealous of each other's authority; a seeming reconciliation took place, which was probably not sincere on the part of either. Cæsar, on his return from Spain, found the consuls at open variance; he, however, soon convinced them that it was the mutual interest of all three to come to an agreement, and this was the foundation of that triumvirate which superseded and demolished all the powers of the old constitution. In the year 55, Crassus and Pompey were again consuls, and in the distribution of the provinces, Syria fell to the lot of Crassus, which afforded him new opportunities of enriching himself, by the plunder of the oppressed inhabitants. He proceeded to Syria, marched to Jerusalem, and seized upon all the treasures of the temple which the moderation of Pompey had spared. He next crossed the Euphrates, invaded the Parthian territories, and leaving garrisons in the principal cities which fell into his power, he recrossed the river and took up winter quarters in Syria. Here he was safely and infamously employed in plundering the temples, and raising money by every species of extortion, while to ingratiate himself with his army and to secure their affection, he suffered the soldiers to indulge in every kind of licentiousness. At the proper season he passed the Euphrates a second time, with 40,000 men. Cassius his lieutenant urged him by all means to keep close to the bank of the river, but the king of Edessa, Abgarus, with a view of betraying the Romans, persuaded Crassus to

take an inland course. He decided on this course, and led the army over barren plains, where they endured extreme hardships from thirst and fatigue, till they came in sight of the Parthian host. Scarcely had Crassus drawn up his legion into a hollow square when he was attacked on all sides and defeated. In this important battle the Romans lost 20,000 in killed, and 10,000 in prisoners. The darkness of the night favoured the escape of the rest, and Crassus, forced by the mutiny and turbulence of this fragment of his army, and the treachery of his guides, trusted himself to the general of the enemy, on pretence of proposing terms of accommodation, and he was put to death, B. C. 53. His head and right hand were cut off, and shewn to his troops, of whom some surrendered, and others attempted to escape, who were mostly cut off by the Arabs. His head was afterwards sent to the Parthian monarch, who caused melted lead to be poured into it, and otherwise insulted his misfortunes.

Crassus, in his youth, was free from those vices which stained the noble Roman youth of the times; as he advanced in years, the love of money, not for its own sake, but with a view of enhancing his importance among his contemporaries, was the rock on which he split. Few among the ancients seem so systematically to have followed the plans of pecuniary profit: and he acquired a greater mass of wealth than any other Roman citizen; hence he obtained the name of Crassus the *Rich*. He was, however, at times exceedingly prodigal of his wealth: once he gave a sumptuous entertainment to the people at ten thousand tables, and he bestowed upon each guest corn enough to supply his wants, and those of his family for three months. He was likewise ready on almost every occasion to lend his money to his friends without interest, which shewed a mind superior to the principles of common avarice; and to the last, when disengaged in projects of ambition, he was fond of philosophy, and took great delight in the study of history. Plutarch. Florus. Univer. Hist.

CRASSUS, JUNIUS PAULUS, a learned and ingenious physician, and native of Padua, where he appears to have been held in high estimation, published in 1581, in 4to. "De purgativis Medicamentis Questiones Medicæ et naturales;"—also, "Meditationes de Theriaca, et Mithridatis," 4to. 1576; and "Mortis repentinæ examen." But his principal merit consists in his being one of the earliest, and most judicious commentators on the works of Hippocrates, Galen, Palladius, and Aretæus, and introducing those authors to more general notice:—contemporary with this writer flourished,

CRASSUS, JEROM, a disciple of Fallopius, but who, although he obtained the dignity of Doctor in Medicine, appears to have confined himself to the practice of surgery, in which branch he published several treatises, which continued to be in great estimation, long after his demise. The principal of those are, "De Calvariæ curatione, et de solutione continui," 4to. 1560, Venet. "De tumoribus præter Naturam et de Ulceribus," 1562. "De Cerafte; seu Basilisco, Morbo Novo, Medicis incognito, Utini," 1593, 8vo. and "De Cauteriis, five de cauterifandi oratione," (of which he made frequent use) 8vo. 1594. Haller. Bib. Med. Chirurg.

CRASTA, in *Geography*, a mountain of European Turkey, in the province of Albania; 4 miles north of Albanof.

CRASTANOVITZA, a town of Croatia, on the river Unna; 26 miles N. W. of Banjaluka, and 20 S. W. of Gradisca.

CRASTONA, or CRISTONA, GIOSEFFO, in *Biography*, a painter.

a painter, born in Pavia, in the year 1664. He studied some time under Bernardino Ciceri, and afterwards went to Rome for improvement. Upon his return to his own country, he employed himself many years in painting small pictures of figures with landscapes, esteemed for the spirit and lightness of their foliage. He died in Pavia after the year 1718. Lanzi. Orlandi.

CRASTUS, in *Ancient Geography*, a town, and also a mountain, of Sicily.

CRASUS, a town of Phrygia Major.

CRATÆGELLA, in *Entomology*, a species of *Tinea*, in the class of *Phalena*.

CRATÆGUS, in *Botany*, Linn. See *MESPILUS* and *PYRUS*.

CRATÆGUS, in *Gardening*, comprehends plants of the hardy deciduous tree and shrub kinds; of which the sorts most commonly cultivated are the hawthorn or white-thorn, (*C. oxyacanthus*); the white beam, or white leaf tree (*C. aria*); the wild service forb, or maple-leaved service (*C. torminalis*); the great American hawthorn (*C. coccinea*); the green-leaved Virginia hawthorn (*C. viridis*); the cockspur hawthorn (*C. cruf-galli*); the woolly-leaved hawthorn (*C. tomentosum*); and the parsley-leaved hawthorn, or azarole (*C. azarolus*).

The first sort is well known to rise with an ascending round much-branched stem or trunk, having a smooth whitish coloured bark, and being beset with sharp thorns, affording flowers of a white colour in May, which are succeeded in the autumn with bunches of dark red berries.

Of this sort there are different varieties, as with large oblong smooth bright scarlet fruit; with buds appearing of a fine bright yellow, and the fruit of a golden colour, being retained all the winter; with white berries and double blossoms, in large bunches: the maple leave at first of a pure white, then turning to faint red; and the Glastonbury thorn, or early flowering thorn.

The second sort is a tree which rises to the height of thirty or forty feet, having a large trunk with numerous branches, with large bunches of flowers of a white colour at the ends of them. It is a native of most parts of Europe, flowering in May.

It has varieties with deeply sinuated pinnatifid leaves, as the Swedish; and with leaves which are not white underneath.

Those of the third sort rise to the height of forty or fifty feet, having a large trunk, spreading at top into many branches so as to form a large head. The flowers are produced in large bunches at the ends of the branches, of a whitish colour, being succeeded by a roundish compressed fruit similar to the haw, but larger. It is a native of Denmark.

And it has a variety, with oblong ovate-leaves, or short foot-stalks.

The fourth kind reaches the height of about twenty feet, having a large upright trunk, branching at top so as to form a large head. The flowers are in large clusters, making a fine show in May, and being succeeded by large pear-shaped fruit of a bright scarlet colour, which becomes ripe in the beginning of autumn. It is a native of Virginia.

The fifth sort has the stem and branches thornless; the leaves being smooth and green on both sides. It has been supposed a variety of the above by Martyn.

In the sixth kind the stem is strong, being ten or twelve feet in height. The flowers are in roundish clusters of a bluish red colour, and the fruit of a globular form having a fine red colour. It is a native of North America, flowering in June.

In the seventh sort the stem is slender and shrubby, rising to the height of six or seven feet, with many irregular branches, armed with long slender thorns. The flowers are small and appear in June, and are succeeded by small roundish fruit which ripens late in the autumn. It is also a native of North America.

It has a variety usually known under the title of Carolina hawthorn, in which the leaves are longer and whiter, and the flowers and fruit larger, but it is without thorns.

The eighth kind has a strong stem twenty feet in height, with numerous strong irregular branches. The flowers in small clusters at the side of the branches, similar in shape to those of the common hawthorn, but greatly larger as well as the fruit which, when fully ripened, has a pleasant acid taste. It is a native of the southern parts of Europe.

Method of Culture.—All the different sorts are capable of being increased with facility, by sowing the seed in the open ground, either in the autumn or spring months, in drills, or broadcast, covering them to the depth of about an inch. The seeds, or haws, may be gathered from the hedges in many of the sorts, and the others be procured from the nursery-men, being employed, when fully ripened. The plants mostly appear in about twelve months. They should be kept perfectly clean from weeds, and be occasionally watered when the weather is hot and dry. When they have had one or two years growth in the seed-beds, they may, in most of the sorts, be removed into nursery-rows, and set out at the distances of from eight inches to two feet, according to the sorts, and from six inches to a foot in the rows; to remain till wanted for the purpose of forming hedges, or planting out in other places, having the top shoots and other parts cut and pruned, as there may be occasion. See *HAWTHORN* and *WHITE-THORN*.

The more beautiful and curious sorts are generally proper for the purpose of planting out, when they have attained three, four, or five feet growth.

For these kinds, in order to continue the varieties, recourse must be had to the practice of budding, grafting, or laying the young branches. The two first methods may be performed upon stocks of the common hawthorn, as any of the sorts will take upon that sort of stock; or upon those of one another; but the former mode is the best. The operations should be performed at the usual season in the manner that is directed under their proper heads. See *BUDDING* and *GRAFTING*.

The young shoots should be laid down in the autumn, and when they have stricken good roots, which, in most cases, happens in twelve or eighteen months, they should be taken off, and planted out in nursery rows, or other places, as above. See *LAYER* and *LAYERING*.

The cuttings of the young shoots, planted out in the spring, in rather moist situations, will sometimes take root, and become good plants. See *CUTTING*.

All the various sorts are hardy, and capable of succeeding in almost any soil or situation, where proper care is taken in their management.

The first sort is a highly useful plant for the purpose of forming hedges for the farmer, being extremely useful in enclosing lands where this sort of fence can be made use of. See *FENCE*.

And all the other species and varieties may be employed as ornamental plants in the clumps and other parts of extensive shrubberies, and other pleasure-grounds and plantations. Many of the sorts have likewise a very ornamental effect, when planted out singly on lawns, or other similar parts of pleasure-grounds, especially when in flower from their beautiful blossom. On this account they have also a fine effect

effect in mixed plantations in various cases of ornamental planting.

CRATÆOGONUM, in *Botany*, Rumph. See *PARIETARIA indica*.

CRATÆOGONUM *amboinicum*, Rumph. See *OLDENLANDIA verticillata*.

CRATÆRIFORMIS, a technical term in *Botany*, somewhat like *Calathiformis*, but not so much bellying out, rather approaching to more dilute forms.

CRATAIS, in *Ancient Geography*, a small river at the extremity of Italy, which ran between Columna and Cœnys, and discharged itself towards the west into the strait of Sicily.

CRATCH, in *Rural Economy*, a name applied in some districts, to signify a cattle rack. It is also occasionally used to denote a creel. See *CREEL*.

CRATCHES, in *Farriery*, a swelling on the pattern under the fetlock, and sometimes under the hoof.

CRATEÆ, or CRATEIÆ, in *Ancient Geography*, islands of the Adriatic gulf, between those of Pharos and Issa.

CRATER, *Cup*, in *Astronomy*, a constellation of the southern hemisphere; whose stars, in Ptolemy's catalogue, are seven; in Tycho's, eight; in Hevelius's, ten; in the Britannic catalogue, thirty-one. See *CONSTELLATION*.

CRATER, in *Falconry*, denotes a line on which hawks are fastened when reclaimed.

CRATER, in *Ancient Geography*, a name anciently given, from its form, to the gulf of Naples.

CRATERII PORTUS, a port of Asia Minor, in the Æolide; it is placed by Thucydides in the territory of the town of Phocæa.

CRATERITES, in *Natural History*, the name of a gem mentioned by Pliny, and said to be extremely hard, and of a middle colour between that of the chrysolite, and of the common yellow amber. This was plainly a species of Chrysolite.

CRATERO, in *Biography*, an ancient painter, from whose works there were some comic figures in the edifice at Athens, which was called *Pompeio*, from the utensils used in their pomps and sacrifices being there deposited. There was also a sculptor of this name, who is said to have been employed at the palace of the Cæsars upon Mount Palatine. Della Valle.

CRATERUS, a famous Macedonian general, who accompanied Alexander in his expedition to India, and enjoyed a greater share of his esteem and confidence than any other commander in his service. Whilst Alexander was marching with his army towards Bactriana, some of his officers formed a conspiracy against his person; and Philotas, the son of Parmenio, was suspected of being a confederate in the treason. Craterus, who regarded him as a rival, availed himself of the opportunity which now offered itself, of extorting by torture a confession of his guilt, in consequence of which both Philotas and also his father, whom he had accused as one of his accomplices, were put to death. That Alexander duly appreciated the character of Craterus is plain from the reflection which he uttered on the death of his favourite Hephæstion: "Craterus," says he, "loves the king, but Hephæstion loves Alexander;" intimating that, whilst the latter had devoted himself in an affectionate manner to his person, the former was concerned for his reputation, and was sometimes less obsequious to his will than he was zealous for his glory and interest. Craterus was no less beloved by the Macedonians in general than by Alexander himself. Whilst he was entrusted by his sovereign with the command of the 10,000 veteran troops who were sent to Ma-

cedonia, on account of their age, wounds, or other infirmities, which rendered them incapable of service, he was appointed to the government of Macedonia, Thessaly, and Thrace, in the room of Antipater, who was recalled to Babylon. After the death of Alexander, the provinces of Macedonia, Epirus, and Greece, were assigned to Craterus and Antipater, who governed them jointly; and in this government Craterus approved himself a prudent and faithful associate; more especially in the operations of the war in which they were unavoidably engaged by the discovery of the designs which Perdicas was forming. So highly was Craterus respected by the Macedonians, that they were desirous of having him for their leader after the death of Alexander; and such was their known attachment to him that Eumenes in the engagement in Cappadocia, which proved fatal to Craterus, took particular care not to oppose any Macedonian against him. Having acquitted himself with great valour on this occasion, and killed several of the enemies with his own hand, he was at last wounded by a Thracian in the back, and falling from his horse was trampled to death by the enemy's cavalry. Eumenes could not forbear shedding tears over a vanquished enemy, whom he had formerly esteemed as a friend; and he caused the last honours to be paid him with all possible magnificence. His bones were conveyed to Macedonia for the disposal of his wife and children. The wife of Craterus was Phila, the daughter of Antipater, one of the most accomplished princesses of her age, no less distinguished by the amiableness of her disposition than by the beauty of her person. Rollin's Anc. Hist. vol. iv.

CRATES, the most distinguished philosopher of the Cynic sect after Diogenes, was by birth a Theban, and flourished about the 113th Olympiad (B. C. 328.) and died after the year 287, B. C. He was honourably descended, and inherited a large estate; but, when he devoted himself to philosophy, that he might be free from the dominion of those passions which are fostered by wealth, he distributed his whole property among the poorer citizens. Leaving his native city, where he had been a disciple of Bryo, reckoned among the Cynic philosophers, he went to Athens, and became a zealous disciple of Diogenes; adopting all the singularities of his master. In his natural temper, however, he was not, like Diogenes, morose and gloomy, but cheerful and factious. This disposition attached to him many friends, and procured for him access to the houses of the most wealthy Athenians. Among the citizens at large he acquired a degree of confidence, which gained him admission into their domestic circles; and he frequently became an arbiter of disputes and quarrels among relations. His influence in private families is said to have had a great effect in correcting the luxuries and vices which prevailed at that time in Athens. His wife, Hipparchia, who was rich and of a good family, and had many suitors, preferred Crates to every other, and when her parents opposed her inclination, so determined was her passion, she threatened to put an end to her life. After marriage she adopted all the peculiarities of the Cynic philosophy. Laertius, l. vi. § 85, &c. Suidas. Apul. Apol. p. 202.

CRATES, an Athenian, succeeded Polemo in the direction of the old academy. Long attached to one another by a similarity of dispositions and pursuits, their friendship was uninterrupted whilst they lived, and they were both buried in the same grave. Crates died about the year 250, B. C.

CRATES, Lat. *Hurdle*. The ancients made use of machines formed of boards and hurdles for covering their men at work as they approached the walls of a town besieged.

CRATEVA,

C R A T E V A.

CRATEVA, in *Botany*, (so called from Cratevas, a Greek physician, celebrated by Hippocrates for his knowledge of plants). Plum. 21. Linn. Gen. 599. Schreb. 818. Willd. 943. Juss. 244. Vent. 3. 121. (Papier; Encyc.) Class and order, *dodecandria*, or rather *polyandria monogynia*. Nat. Ord. *Putamineæ*, Linn. *Capparides*, Juss.

Gen. Ch. Cal. Perianth inferior, one-leafed, flat at the base, deeply four-cleft; segments egg-shaped, deciduous. Cor. Petals four, attached by the claws to the calyx. Stam. Filaments indeterminate in number, bristle-shaped, inserted into the pedicel of the germ; anthers erect, oblong. Pist. Germ on a long filiform column or pedicel; style none; stigma capitate. Peric. Berry pedicelled, fleshy, one-celled. Seeds numerous, bedded in the pulp, roundish, emarginate.

Ess. Ch. Calyx four-cleft. Petals four. Filaments inserted into the pedicel of the germ. Stigma sessile. Berry one-celled, with many seeds.

Obs. In *capparis*, which is very nearly allied to the present genus, the filaments are attached to the edge of the receptacle; but this, as Dr. Sims rightly observes, (see *Botanical Magazine*, 596.) is only a slight difference, as the column or pedicel itself is only an elongation of the centre of the receptacle. In the habit of the plants there is, however, this striking distinction, that the leaves are ternate in *crateva*, and simple in every species of *capparis*, except the *falcata* and *magna* of Loureiro (*n.* 27 and 41 of this dictionary) and a farther investigation of the attachment of the filaments will perhaps shew that these species ought to have been referred to *Crateva*.

Sp. 1. *C. tapia*. Linn. Sp. Pl. 2. Mart. 2. Poir. 1. Willd. 2. (*Agioscorodon*; Pluk. *Almag.* 34. tab. 137. fig. 7. *Malus americana*; *Comm. hort.* 1. 129. tab. 67. *Tapia*. Plum. gen. amer. 22. tab. 21. *Mareg. Brasil.* 89. Pil. *Eraf.* 68. tab. 69.) "Leaflets egg-shaped, acuminate; petals ovate-roundish; germs globular." A large tree, from thirty to thirty-six feet high, covered with a dark green bark, divided near the top into numerous branches, which form a thick and spreading head. *Leaves* alternate, petioled, ternate; leaflets unequal, entire, smooth, and green on both sides. *Flowers* on long, alternate, smooth peduncles; forming a loose, spreading, terminal panicle; segments of the calyx egg-shaped, scarcely acute, much shorter than the corolla; petals roundish-egg-shaped, obtuse, spreading, all inclined to the same side; claws as long as the laminae; filaments twice the length of the petals; anthers purple; germ globular. *Fruit* the size of an orange, with a hard brown rind. *Seeds* kidney-shaped. A native of Jamaica, Brazil, &c. 2. *C. gynandra*. Linn. Sp. Pl. 1. Mart. 1. Poir. 3. Willd. 2. Brown. *Jam.* 246. (*Anona*; Sloan. *Cat.* 206. list. 2. 170. *Arbor americana*; Pluk. *Phyt.* 147. fig. 6.) "Leaflets membranous, egg-shaped, quite entire; petals lanceolate." A tree, twelve feet high and more, with spreading branches. *Leaves* alternate, on long petioles, ternate; leaflets petioled, acute, nerved, veined, very smooth, thin, deep green. *Flowers* numerous, in panicled racemes; peduncles simple, smooth, scattered; segments of the calyx egg-shaped, acute, spreading; petals sometimes four, but more frequently only two, whitish; filaments from twenty to twenty-four, longer than the petals, declining, green, tinged with purple; anthers dark purple; pedicel of the germ the length of the calyx. *Fruit* brown, spherical, having, like that of the preceding species, a smell of garlic. A native of Jamaica. Obs. Linnæus calls this species gynandrous, from a misconception of the nature of the pedicel of the germ, which cannot be considered as sustaining the office of a style; the stamens, therefore, are

by no means inserted on any part of the pistil; but, even if they were, the specific name would in this case be improper, all the other species having a similar character. The only difference is that some of them are inserted higher on the pedicel than the others. 3. *C. abbrevata*. Mart. 5. Poir. 2. Willd. 3. Vahl. *Symb.* 3. 61. "Leaflets and petals inversely egg-shaped; germ oblong." A tree with numerous smooth branches near the top. *Leaves* alternate, petioled, ternate; leaflets unequal, mucronate, smooth, veined underneath. *Flowers* in a spreading, terminal panicle; peduncles alternate, simple, long; segments of the calyx oblong; petals with long claws; filaments three times the length of the petals. A native of Madagascar. 4. *C. religiosa*. Mart. 4. Poir. 4. Willd. 4. Lam. *II.* Pl. 395. Forst. *Prod.* 203. plant. succ. 45. Vahl. *Symb.* 3. 62. Nürvaia; Rheed. *Mal.* 3. 49. tab. 42.) "Leaflets and petals lanceolate-elliptical, narrowed at both ends." A middle-sized tree. *Branches* spreading, smooth, olive-coloured, dotted with white. *Leaves* alternate, on long petioles, ternate; leaflets almost equal, on short petioles, smooth on both sides, netted with many nerves and veins, an inch long and more. *Flowers* greenish white, in a loose terminal panicle; peduncles long, cylindrical, simple, smooth; segments of the calyx small, egg-shaped; its base remaining on the pedicel of the fruit; petals narrow, much longer than the calyx; stamens twelve; filaments twice the length of the corolla or a little longer; pedicel of the germ longer than the stamens. *Fruit* globular, the size of a small plumb. A native of the East Indies and the Society Islands. In the latter it is planted in their burial-grounds, and is supposed to be sacred to their idols. The fruit is eaten by the natives. 5. *C. fragans*. Bot. *Mag.* 596. (*C. capparoides*; Bot. rep. 176.) "Stem twining; corolla regular; petals very long, undulated." *Stems* several, extending from 10 to 20 feet, with a multitude of branches. *Leaves* alternate, petioled, ternate; leaflets almost sessile, egg-shaped, entire, shining. *Flowers* in terminal clusters, on long peduncles, yellowish-green, very fragrant; segments of the calyx large, ovate-acuminate, concave, equal; petals very narrow; claws long; laminae undulated and convolute towards the base, regularly spreading; stamens numerous, longer than the calyx, shorter than the petals, attached to the pedicel of the germ near its base, incurved; stigma annular; pedicel of the germ longer than the stamens. A native of the island of Bananas, and of Sierra Leone in Africa; discovered by Dr. Afzelius, and raised in England from seeds sent by him to T. Evans, esq. of Stepney; but it has not yet ripened its fruit in this country. It is propagated easily by cuttings, but to thrive well requires more room for its roots than a pot. 6. *C. marmelos*. Linn. Sp. Pl. 3. Mart. 3. Poir. 5. Willd. 5. (*Cucurbitifera*; Pluk. *Alm.* 125. tab. 170. fig. 5. *Cydonia exotica*; Bauh. *Pin.* 425. *Bilanus*; Rumph. *Amb.* 1. 191. tab. 81. *Covalam*; Rheed. *Mal.* 3. 37. tab. 37. *Burm. Flor.* Ind. 109.) "Thorny; leaves serrated." A tall tree, with a large trunk; branches numerous, thick, cylindrical, smooth, leafy, armed between the leaves with divaricating pairs of long acute spines. *Leaves* alternate, petioled, ternate; leaflets oblong, acute, smooth on both sides; common petiole very long. *Flowers* green on the outside, whitish within, sweet-scented, six or seven together on a common branched peduncle, forming small terminal and lateral racemes. *Fruit* the size of an orange; containing, in a hard rind or shell, a thick, viscid, yellowish pulp, which has an agreeable flavour, and is frequently served up by the East Indians in their deserts, mixed with orange and sugar.

Obs.

Obs. Linnæus placed the last species under this genus, though he was aware that it does not correspond with his generic character, observing that it has a five-cleft calyx, sixty stamens, and no petals; but with respect to the last particular, he has since been found to have fallen into an error. Jussieu afterwards remarked, that it seems to have more affinity to his natural order aurantia than to his caparides, to which the other species of *crateva* properly belong. The well-known Dr. Correa has confirmed the suggestion of Jussieu; and in an excellent paper, inserted in the fifth volume of the Linnæan Transactions, p. 218, has established for it a new genus, which he has called *Aegle*, the name of one of the Hesperides. As this new genus has, through some oversight, been omitted by us in its proper place, we shall here give its natural character. *Cal.* Perianth one-leaved, small, five-lobed, falling off before the maturity of the fruit. *Cor.* Petals five, many times larger than the calyx, ovate-acute, spreading. *Stam.* Filaments very numerous, short, awl-shaped, inserted into the outer side of an elevated receptacle or hypogynous disk; anthers oblong, erect. *Pist.* Germ superior, egg-shaped; style short, thick; stigma oval; (according to Kœnig, marked with many obsolete furrows.) *Peric.* Berry globular-top-shaped, with a smooth pitted rind, which finally becomes woody; cells in Correa's specimen ten, surrounded with a spongy flesh, which, after the fruit ripens, soon disappears. *Seeds* numerous in each cell, egg-shaped, compressed, hairy, attached in a single series to a short, straight, umbilical cord. There are in the herbarium of sir Joseph Banks two seemingly distinct species of this genus, both arboreous, and both natives of the East Indies. The *crateva* balangas of Kœnig is considered by Dr. Correa as another distinct genus, which he has described under the name of *feronia*. See FERONIA.

CRATEVA foliis singularibus; BROWN. See CAPPARIS ferruginea.

CRATEVA, in *Gardening*, comprehends plants of the exotic tree kind for the stove; of which the sorts mostly cultivated are the smooth *crateva* or garlic pear (*C. tapia*), and the prickly *crateva* (*C. marmelos*).

Method of Culture.—These two plants are capable of being increased by sowing the seeds, which have been procured from the places where they grow naturally, as soon as they arrive, in pots of light rich earth, and plunging them immediately in the bark bed of the stove. The plants, after they have obtained the growth of about three inches, should be removed and placed out in separate pots, a very little water being given at the time, replunging them immediately in the hot bed.

The plants require afterwards to be kept constantly in this situation, and to have the care and management of other tender woody plants of the exotic kind, which have similar habits of growth.

CRATHES, in *Ancient Geography*, *Crati*, a small river of Italy, in Brutium. It commenced S.E. of Consentia, pursued a northern course to Caprafæ, whence it flowed by the north-east, and discharged itself into the gulf of Tarentum, near Sybaris. Strabo says, that the waters of this river gave a white colour to the hair of those who drank them; and they are said to have been useful in medicine. Herodotus and Pausanias inform us, that the river derived its name from Crathis of Achaia. Near its mouth was a temple of Minerva, surnamed *Crathian*. See CRATI.—Also, a river of Achaia, E. of Bura, which had its source in a mountain of the same name in Arcadia, near Cyllene, and ran from the S.W. to the N.E. into the gulf of Corinth. It received, in its course, the Alysson and the Styx.—Also, a river of Asia, in Cilicia.

CRATI, in *Geography*, a river of Naples, which, proceeding from the eastern vallies of the Sila, passes by the foot of the declivity on which Cosenza stands, and receives the waters of the Busifento; which torrent is remarkable for containing within its bosom the bones of Alaric, the mighty leader of the Visigoths. See CRATHIS.

CRATIA, in *Ancient Geography*, an episcopal city of Asia.

CRATICULA, a chemical instrument, made of square pieces of iron of about a finger's thickness, placed so as to have half a finger's space betwixt them. It is used in making of fires to keep up the coals.

The word is Latin, importing a roaster, or gridiron.

CRATICULAR ECTYPE and *PROTOTYPE*. See ANAMORPHOSIS.

CRATINOPOLIS, in *Ancient Geography*, an episcopal city of Africa, in Mauritania Cæsariensis.

CRATIPPUS, in *Biography*, a peripatetic philosopher, born at Mitylene, where he was brought up, and where for some time he was engaged in teaching others the tenets of the philosophy which he embraced. At Athens, whither he removed, he rose to great celebrity, and acquired the esteem and friendship of some of the most eminent men of his age. Cicero sent his son to be educated by Cratippus; and so highly did the orator think of his talents, that he took pains to obtain for him, of Cæsar, the freedom of Rome; and afterwards moved the Arcopagus to make a decree, to desire Cratippus to live at Athens, as an ornament of the city, and for the purpose of instructing the young. Pompey and Brutus were likewise among his admirers. The former, after the battle of Pharsalia, visited the philosopher, when their discourse turned upon the ways of Providence, which the warrior, depressed by his misfortunes, seemed willing to blame, but which Cratippus vindicated with manliness, but with a delicacy which the situation of Pompey seemed to require. Brutus attended the lectures of this wise man, when he was on the point of engaging in war with Marc Antony. These are the proofs mentioned by Bayle and others, to shew that Cratippus recommended himself to persons of consideration, not only by the extent of his learning, and the wisdom of his precepts, but by the agreeableness of his manners, and the pleasantry with which he enlivened the hours of social intercourse. By these qualities he is said to have attached the youth entrusted to his care to himself, and to the pursuits of literature. He wrote some treatises concerning divination, which were regarded as hypothetical and fanciful, rather than argumentative and philosophical. Tertullian is supposed to have referred to the works of Cratippus, when he is speaking of a treatise on dreams, ascribed to a person of that name. Bayle.

CRATIUM, in *Natural History*, a name given by Argenville to the *MYTILUS frons* of Gmelin.

CRATO, in *Geography*, a town of Portugal, in the province of Estramadura, surrounded with an ancient wall, and containing a church, hospital, and convent; 10 miles W. of Portalegre.

CRATON, also called *CRAFTHEIM*. JOHN, in *Biography*, was born at Breslaw in 1519. He received his first instruction under Philip Melancthon, and being intended for the church, he afterwards studied for six years under Martin Luther at Wittenburgh. Being more inclined to the practice of medicine, he was sent to Padua, and placed under professor Monti. He here took the degree of doctor, and returned and settled at Breslaw, whence, at the end of a few years, he was called to Vienna, and made physician and aulic counsellor to the emperor, Ferdinand I. He filled the same post under the two succeeding emperors, Maximilian and Rodolph,

dolph, which he notices in an epigram he composed a short time before his death :

“ Cæsarius placuisse tribus, non ultima laus est,
Me pater hac ornans, filius atque nepos.”

His works were numerous: the titles of the principal of them were, “ De Morbo Gallico Commentarius,” Franc. 1594, 8vo.; “ De vera præcavendi et curandi Febrem contagiosam pestilentem Ratione,” 1594; “ Methodus Therapeutica ex Galeni et Montani Sententia.” There were also published seven volumes in 8vo. of Epistles and Consultations. He died Nov. 9th, 1585. Haller Bib. Med. Eloy Dict. Hist.

CRATOWNESS, a cape on the E. coast of Scotland, in the county of Kincardine; 3 miles S. of Stonehaven.

CRAVALIDÆ, or CRAUGALIDÆ, in *Ancient Geography*, a small country of Greece, in the territory of Phœcia, near the town of Cyrrha. Suidas.

CRAVAN, in *Geography*, a small town of France, in the department of the Yonne, 12 miles S. of Auxerre, near the junction of the rivers Cure and Yonne, famous for a good sort of Burgundy wine.

CRAVANT, in *Ornithology*, a name by which Bellonius and some others have called the barnacle, a small species of wild goose, common in winter on the coasts of Lancashire, the *ANAS Bernicla* of Gmelin, and the *Brent-goose* of other writers. See *BARNACLE Goose*.

CRAVATES. See *CROATES*.

CRAU D'ARLES, LA, in *Geography*, is a considerable extent of very stony ground in the department of the Bouches du Rhône, in France, in the commune of Arles, which has lately been fertilized by a canal from the river Durance, called the canal of Craponne. The numerous flocks of sheep which are kept here leave this plain in summer, to feed on the high mountains of the neighbouring departments, for which reason they are called *bêtes à laine transhumantes*, wandering sheep.

CRAVEN, or CRAVENT, in *British Antiquity*, a term of reproach used in trials by battle.

The law was, that the victory should be proclaimed, and the vanquished acknowledge his fault, in the presence of the people, or pronounce the word *cravent* in the name of recreantice, or cowardice, &c. and, presently, judgment to be given; and the recreant *amittere legem terræ*, i. e. become infamous.

Coke observes, that if the appellant join battle, and cry *craven*, he is to lose *liberam legem*. If the appelled cry *craven*, he is to be hanged. See *Wager of BATTLE*, and *COMBAT*.

CRAVEN, in *Geography*, a county of America, in the state of N. Carolina, and district of Newbern, bounded N. by Pitt and S. by Carteret and Onslow counties. Its chief town is Newbern: it contains 10,469 inhabitants, of whom 3658 are slaves.

CRAVETTA, AIMONE, in *Biography*, an eminent lawyer in Piedmont, was born in 1504. When young he was of so delicate a constitution, that his parents had little hopes of rearing him; and in proportion to their great anxiety, they prevented him from pursuing his studies. Notwithstanding these disadvantages, he made so much proficiency as to be highly esteemed as a professor at the age of twenty; and in three years after, having received the title of doctor, he was sent as jurist to Curio, and thence he practised as advocate at Turin. Upon the breaking out of a war in Piedmont, he was imprisoned two years, and not allowed the use of his books. In 1558 he was successively professor of law at Grenoble and Lyons: at the latter city

he printed his “ Consultations.” He was also public teacher of his science at Avignon and Ferrara, and was invited to Pavia, and at length returned to Turin, where he obtained a stipend of 1200 crowns. In this city he died in 1569, highly respected for his talents and indefatigable application. Besides his “ Consultations,” he was author of a work on the subject of jurisprudence, entitled, “ *Traçtatus de Antiquitatibus Temporum*,” printed after his death in 1581.

CRAUGIÆ, in *Ancient Geography*, small islands on the coast of the Peloponnesus, near Cape Spiræa, according to Pliny.

CRAULA, or CRAULAU, in *Geography*, a small town of Germany, in the duchy of Saxe-Gotha, containing 117 houses, and 354 inhabitants, who are chiefly hop-planters.

CRAW, CROP, or *Ingluvies*, a part in granivorous fowls which serves for the immediate reception of the food; where it remains some time for maceration, before it be transmitted to the stomach.

This *ingluvies* is furnished with glands, which, the patrons of fermentation maintain, convey a menstruum thither, that impregnates the aliment, and serves instead of mastication.

CRAW, or *Cray Fish*, in *Ichthyology*, a species of the *Cancer*, the *cancer asclacus* of Linnæus. (See *CANCER fluviatilis*, under the genus *Asclacus*.) The flesh is good and nutritious, and has been recommended to persons under atrophies. There are various methods of preparing these animals: they may be either boiled or fried, and then taken out of their shells and made up in variety of dishes; but no parts of them are eatable except their claws and tail. Preparations and broths of *cray-fish* have been celebrated not only for a palatable aliment, but also for answering some medicinal intentions, as being of a moistening quality, and correcting acrimony. The broth is prepared of four or five *cray-fish*, which, having their heads cut off, and their intestines extracted, are to be bruised and boiled in the broth of flesh or poultry, until they become sufficiently red; after which the liquor is to be strained off and seasoned, as the case may require. This broth may be rendered still more medicinal by the addition of herbs, snails, or other substances; according to the intention of the physician. The flesh is counted best in the summer months.

The delicate flavour of these fish depends in a great measure on their food. When they have well-tasted food, their flesh preserves the relish of it; but when they feed on other things, they are often rendered of no value, by the flavour communicated to their flesh by them. There are great quantities of these fish in the river Obra, on the borders of Silesia; but the people find them scarcely eatable, because of a bitter aromatic flavour, very disagreeable in food. It has been since observed, that the *calamus aromaticus* grows in vast abundance on the banks of that river, and that these creatures feed very greedily upon its roots. These have a very remarkable bitterness mixed with their aromatic flavour, while fresh, which goes off very much in their drying; and on comparing the taste of these roots with that of the *cray-fish*, there remains no doubt of the one being owing to the other. Aët. Léipl. 1690.

They abound in the river Don in Muscovy, where they are laid in heaps to putrefy; after which the stones, called *crab's eyes*, are picked out.

These animals are very greedy of flesh, and flock in great numbers about earcases thrown into the water where they are, and never leave it while any remains. They also feed on dead frogs when they come in their way. James.

In Switzerland, there are some *cray-fish* which are red,
while

while they are alive, and others blueish. Some kinds of them also will never become red, even by boiling, but continue blackish.

The cray-fish discharges itself of its stomach, and as M. Geoffroy thinks, of its intestines too. These, as they putrefy and dissolve, serve for food to the animal; during the time of the re-formation, the old stomach seems to be the first food the new one digests. It is only at this time, that the stones are found called *CRAE'S eyes*; they begin to be formed when the old stomach is destroyed, and are afterwards wrapped up in the new one, where they decrease by degrees till they entirely disappear.

CRAWFORD, *New*, in *Geography*, a town of the island of Jamaica; about 16 miles N. of Kingston.

CRAWFORD, *Old*, a town of Jamaica, now deserted, about 13 miles N. of Kingston.

CRAWFORD, a town of America, in the state of Virginia; 5 miles N. of West Point.

CRAWINKEL, in ancient documents *Gravincella*, is a small town of Germany, in the duchy of Saxe-Gotha, near the forest of Thuringen. It has 209 houses, and 934 inhabitants, who derive their chief subsistence from burning charcoal, making lamp-black, and acting as waggoners.

CRAWLEY, or *HUSBORN-CRAWLEY*, a vicarage in Bedfordshire, in the hundred of Marhead. The southern parts of this parish are situated on the Woburn-sand stratum, and the remainder upon the Clunch clay stratum, which here crops from beneath the sand. The sand-hill on which the church stands has a layer of fuller's earth in it, beneath which some very large specimens of petrified wood were a few years ago dug out, that are in the possession of Richard Howe, esq. of Aspley, an adjoining village. The clay hill north of the church is occasioned by a considerable fault which crosses the parish in a north-east direction, with an extensive depression of the sand stratum to the south of it. The top of the clay above-mentioned, abounds with large and thick gryphites, or oyster-like shells, perforated by some other fish, at the time the fish were alive in these gryphites; very beautiful small cornua-ammoni in golden pyrites, are also found in this clay at the brick-kilns, and a stoney subitance, here called *CLUNCH*, see that article. In 1796, this parish was inclosed under an act of parliament, and a large heath was in consequence taken into the duke of Bedford's park, and cultivated, except the steep and most barren parts, which were planted. A very extensive peat bog, between the village, or Town-street, and the church, which had long exerted its deleterious influence on the health of the inhabitants; as a comparison of the proportions of births to burials in this parish and many adjoining villages proved; was effectually drained in consequence of the inclosure, under the directions of Mr. Farcy, the agent of the late duke of Bedford, and preparations were at the same time made for an extensive irrigation in this vale. The situation of Crawley iteple was ascertained in the government trigonometrical survey, by an observation from Bowbrick hill station, distant 15,998 feet, and bearing 65° 44' 61" south-west from the parallel to the meridian of Greenwich, and another from Trusser hill station, distant 8,867, whence was deduced its latitude 52° 0' 57" north, and its longitude 0° 36' 19".8, or 2^m 25'.3 west of Greenwich. A new barn and premises, erected on a hill in the new park, were also observed, and the centre of the front or south side was found to bear 53° 55' 2" south-west of the parallel above-mentioned, and to be distant 6023 feet from the centre of the iteple. A new and excellent turnpike road was, in 1796, made through this village, at the expence of the late duke of Bedford, in lieu of one which formerly went through his park; the cottages were, in general, re-

paired, and several new ones built; gardens were allotted to each of them, and as great an alteration made for the better, in the appearance and comforts of this village, as perhaps has any where else been witnessed.

CRAE, in *Ornithology*, a genus of the gallinaceous order. The bill is strong and thick, with the base of both mandibles covered with a cere; nostrils small, and placed in the middle of the cere; head crested with revolute feathers; tail large, straight, and expandible.—Curassow.

Species.

ALECTOR (*male*.) Cere yellow; body black; belly white; (*female*) red; head blueish; crest white, tipped with black. *CRESTED CURASSOW*.

Linnæus describes the male and female as two distinct species, the first under the name of *alector*, the other *rubra*. The male is about the size of a small turkey; the bill an inch and three quarters long, dusky, and covered from the middle with a skin which passes backwards round the eyes. The general plumage is deep black. The top of the head is elegantly crested with upright twisted feathers of a black colour, the longest of which are nearly three inches long, the others shorter; the lower part of the belly, vent, and thighs white; its tail is eleven inches long, and consists of fourteen feathers, which are a little rounded in shape, and of a black colour. The legs strong and dusky brown. This is the *Crax guianensis* of Brisson, *Mituporanga* of Ray, *Hocco de la Guiane* of Buffon, *Indian cock* of Pitfield, *Guiana peacock pheasant* of Bancroft, and *Crested Curassow* of Brown. The female is about the size of the male; the bill ash-coloured; irides red, and the head crested as in the other sex, the feathers white with black tips. The head, and hind part of the neck ash-coloured; fore part of the neck, and rest of the plumage red-brown; tail plain and dusky black; legs brown. This is called *Hocco de Perou* by Buffon, and is the *Red Peruvian hen* of Albin.

The crested Curassow is a native of the mountainous parts of Mexico and Peru, where, in their natural state, they feed on fruits, and roost in trees. They are remarkably docile, and have been cultivated, with much success, in the warmer parts of America, and the West Indian islands. At Guiana, where they constitute a principal article of food among the planters, these birds are known by the name of Powese, and they are also common in the (late) Dutch settlements of Berbice, Essequibo, and Demerara. At the Brasils it is known by the name of Curasso. The flesh is white, and well-flavoured. Some endeavours have been made to naturalize these birds in England, but the climate is neither sufficiently warm, nor dry enough for this purpose, and they are hence rather more likely to remain an ornament to our menageries, than become of permanent utility in our yards of poultry.

There are several interesting and beautiful varieties of this species, among which may be mentioned the *Crax Mitu* of Linnæus, which latter observation has proved to be only a variety of the *Alector*; it is the size of the others, and has the bill crooked, about an inch and a half in length, the upper chap four times as large as the lower, and of a flesh colour, with the tip whitish. Behind the ear is a white naked spot; and the head is crested with long feathers which may be elevated at the pleasure of the bird, into a conspicuous crest. The feathers on the head, neck, and breast are velvety; the rest of the plumage black, except the belly and under the tail, which are of a brown colour, almost like that of a partridge. Another variety *Hocco, Faisan de la Guiane* of Buffon, differs in having the tip of the tail white; and a fourth kind has the crest white tipped with black; neck barred with black and white; thighs brown; and vent white. Sometimes also, the tail is barred alternately

black and white. The above are varieties of the male bird; the females vary also very considerably. Some of the latter have the neck annulated with black and white; belly white; and tail brown: and others have the body barred with red-brown, and yellowish or cream colour. But one of the most elegant varieties is of a red brown colour, palest beneath: the bill yellow-ochre, with the tip brown: sides of the head covered with feathers, and black; crest white, and black at the tip; neck ringed, black and white; tail brown, crossed with nine yellowish-white bands, bounded on both sides with black; legs yellowish, with dusky claws.

GLOBICERA.—Yellow; gibbosity of the nostrils globular; body blackish-blue; lower part of the belly white.—*Crax Curassow*, Brisson, *Gallina Indica*, Aldrovandus, *Curassow bird*, Edwards, *Globose Curassow*, Latham.

This is the size of the last, and has the bill yellow with the tip cinereous, and at the top over the nostrils a round gibbosity somewhat resembling a cherry in its form, very hard, and of a fine yellow colour. The irides are red, and the space round the eyes white. The feathers on the head are long, and form a crest pointing forwards, the feathers are black with white tips, and rather inflected. The general colour of the plumage is black, except the lower part of the belly, vent, and space across the thighs, all which are white; legs pale ferruginous. The female has the head and hind part of the neck black; the crest black, with a white band. Some of the neck feathers have the tip white; the fore part of the neck, and breast, back and wings are dull brown; the upper part of the belly white, with some of the feathers tipped with black; lower part of the belly, vent, and thighs pale yellowish-brown; the tail crossed with four broad bands of white; the knob on the bill is yellow as in the male, and the bill is cinereous, but the legs are ash-coloured. This is a native of Guiana.

PAUXI. Cere blue; gibbosity of the nostrils crested; body blackish; belly and tip of the tail white.—*Crax Pauxi*, Linn. *Crax Mexicanus*, Brisson. *Pauxi*, Hernandez, *Hocco du Mexique*, Buff. *La Pierre de Cayenne*, Buff. *Cushew Curassow*, Edwards.

Size of the preceding, but of a more slender form. The bill is red, with a gibbosity at the base as large as a small pear, and not unlike it in form, very hard, and of a fine blue colour; the base of the mandible is also blue. The plumage is glossy blue-black, with a tinge of purple; lower part of the belly, under tail coverts, and tip of the tail, white; legs pale red; claws black. The female is distinguished by having those parts brown, which in the male are black. The species inhabits Mexico.

GALEATA. Crown horny; body black; vent white. *Le Hocco à tête calleuse*, Brisson. *Galeated Curassow*, Lath.

This is nearly as large as a turkey. The general colour black, except the vent, and under tail coverts, which are white; on the crown of the head is a horny substance about two inches in height, broad at bottom, and ending above in a blunt point, resembling altogether a kind of cone. The bill and legs are red. Inhabits Curassow.

VOCIFERANS. Brown; bill and breast blue; belly whitish.—*Penelope Vociferans*, Gmel. *Le Chacamel*, Buffon, *Chachalacamel*, Fernandez, *Crying Curassow*, Lath.

Described from an account given of it by Fernandez. It is the size of the common fowl; and is remarkably clamorous and noisy, whence the Mexican name *Chachalacamel*, or crying bird. This kind inhabits mountainous situations in South America.

CRAY, in *Geography*, a river of England, which runs into the Darent near Dartford, in Kent.

CRAYE, a river of Wales, which runs into the Ustk in Glamorganshire.

CRAYER, a kind of small sea-veffel or ship. It is mentioned in the Stat. 14 Car. II. c. 27. and in old records, *Et transitus craerarum & battellorum cum vicualibus & aliis necessariis, &c.* Parl. 6 Ric. II. Par. 2. M. 13.

CRAYER, DE, CASPAR, in *Biography*, a painter of some eminence, born in 1592. He was a native of Antwerp, and was the scholar of Raphael, the son of Michael Coxie of Brussels. He soon, however, surpassed his master, and, aided by the study of the best pictures, to which he could have access, acquired a skill, according to the opinion of his cotemporaries, only inferior to that of Rubens and Vanduyke.

Caspar was held in such esteem at Brussels, that the government proposed to confer upon him several offices and a pension, aiming thereby to prevent his quitting that city; but he declined the honours that were offered him, and afterwards resided at Antwerp, where he was visited by Rubens, who bestowed the highest encomiums on a picture (a large composition) which Caspar was then painting, of the Centurion alighting from his Horse to prostrate himself at the Feet of our Saviour. Sir Joshua Reynolds, however, does not seem to entertain so high an opinion of this artist's merit, as will appear from the following extract from his journey into Holland.

“Here is an immense picture of Gaspar de Crayer, mentioned not on account of its excellence in my own opinion, but from its being in such high estimation in this country, and it is certainly one of his largest works. Though it cannot be said to be defective in drawing or colouring, yet it is far from being a striking picture. There is no union between his figures and the ground; the outline is every where seen, which takes away the softness and richness of effect; the men are insipid characters, and the women want beauty. The composition is something on the plan of the great picture of Rubens in the St. Augustins at Antwerp: that is, the subject is of the same kind, but there is a great difference indeed in their degree of merit. The dead and cold effect of this picture, as well as many others of modern masters in this gallery, sets off those of Rubens to great advantage. It would be a profitable study for a young painter to look from those pictures to Rubens, and compare them again and again, till he has investigated and fixed in his mind the cause and principles of such brilliant effects in one instance, and of failure (when there is failure) in the other.”

Caspar, after having devoted a long life to retirement and the constant study of his profession, died in 1669. The following are amongst the principal pictures which he painted in the churches of Brussels and of Gand: A Resurrection, an Altar-piece in the church des Freres de la Charité in the latter town; another Altar-piece in the church of the Augustins, representing the crowning of several saints; and in the church of Notre Dame, behind the altar, an Ascension. Descamps.

CRAYFORD, in *Geography*, a rectory in Kent, in the lath of Sutton. The Darent and Cray rivers are navigable for barges, and the tide flows up to the calico-printing mills within a mile of this town. The church stands high on the top of the sand stratum covering the chalk, in a lifted or very dislocated part, a considerable thickness of gravel covers the loam on the top of this sand, to the westward of the church, extending towards the windmill on the common. A station was chosen in 1799 upon the top of this steep for the small instrument in the trigonometrical survey, its situation being determined by an observation from Severndroog tower, distant 26,479 feet, and bearing 80° 50' 1" N.W. from the parallel to the meridian of Greenwich, and another from Well-hill station, distant 37,840 feet, and bearing 9° 14' 45" S.W. from the said parallel; whence

whence is deduced its latitude $51^{\circ} 27' 17''.8$ N. and its longitude $0^{\circ} 10' 32''.2$ E. of Greenwich. This station was used with Ash steeple for determining the place of Dartford Brent mill, and Northfleet church; with Charlton farm station for Darent steeple; with Dartford Brent mill for Stone steeple; with Severndroog tower for Buxley spire; and with Well-hill station for Ash steeple, Charlton farm.

In the village of Crayford, formerly called "Creccanford," Hengist, two years after the death of his brother Horsa, A.D. 455, gained a great victory over the Britons under Vortimer, which gave him possession of all Kent, and emboldened him to assume the name of *king*, having before this event contented himself with the more humble title of "heretogen" or general. Thus was the first Saxon kingdom, that of Kent, founded, about eight years after the arrival of Hengist and his followers in this island. The river Cray, that passes through this village, serves to work a mill for slitting and rolling iron, and another for a cotton manufacture. Crayford is 2 miles W. of Dartford, and 13 E.S.E. of London.

CRAYON, a general name for all coloured stones, earths, or other minerals and substances, used in designing, or painting in pastel; whether they have been beaten and reduced to a paste, or are used in their primitive consistence, after sawing or cutting them into long narrow slips.

In this last manner are red crayons made, of blood-stone, or red chalk; black ones, of charcoal and black lead. The best charcoal is that of willow, on account of its softness. Crayons of all other colours are compositions of earths reduced to paste.

Good crayons for the purpose of drawing and painting are not easily procured. Those formed from red chalk, which are in common use, are almost always hard, gritty, and destitute of an uniform consistence. The only good crayons used in France are manufactured exclusively at Paris, where they are sold at a very high price: the best fort having been long known there by the name of the paste crayons of Desmarests, who seems to have been the inventor. Induced by these considerations, M. C. F. Lomet made a variety of experiments with a view of ascertaining the best combinations of various substances adapted to the fabrication of crayons; and the results that were satisfactory are here subjoined. These crayons are composed of the softer kind of ochre or redde, which is an oxyde of iron mixed with earth of an argillaceous nature, and called hematites or bog-ore. This must be incorporated with some agglutinating substance, such as gum, glue, or rosin, to which is sometimes added soap for softening the composition. Instead of redde, the other red oxydes of iron may be used, such as colethar of vitriol, &c.: but these should be chosen soft to the touch and of a lively colour; whereas those made for sale are often mixed with too much clay, which gives them a dull yellowish cast that ought to be avoided. The best redde, in lumps, should be selected, and ground with pure water on a marble slab, as is done in the preparation of colours for painting: moistening it with a little water, just sufficient to make the grinding stone slide. For preparing a large quantity, the redde must be pounded and sifted through a fine sieve, then diluted with a large quantity of water in a trough, where, after being well stirred, it should be left for a few minutes to settle, that the grosser particles may subside to the bottom. The water, strongly impregnated with the finer particles, must then be poured off, and allowed to settle for 24 hours: when the clear water has been poured off, a fine sediment will be obtained, which must be again pounded and washed. The process is repeated till the whole is reduced to the utmost fineness. The

gum, glue, or soap, necessary for giving to the crayons a due degree of solidity, must be separately dissolved. The solutions must then be carefully mixed with the pounded ochre or redde, and the water evaporated by exposure to the sun or the heat of a gentle fire, taking care frequently to turn the paste till it has acquired a consistence somewhat harder than butter; the crayons are then to be formed in the moulds, which may be done two ways: first, by spreading out the paste on a board, in which are cut grooves rather broader at the top and round at bottom, and of any length, size, and depth, according to the proposed bulk of the crayons; or otherwise, which is the better method, by forcing the paste through a pipe or funnel of an orifice equal to the size of the crayon. The paste thus formed may be left to dry in a cool place under the shade, in order to prevent cracks, which a more rapid desiccation would produce. When the rods are dry, they are to be cut into a proper length; and the edges should be taken off; after which they must receive the first cutting, in order to give them a blunt point. The last operation is that of scraping them, for the purpose of taking off the hard outward coat formed on the surface in drying, and which would prevent their making any marks. It may be necessary to rub a small portion of oil into the grooves of the wood, that the paste may not adhere too closely to the moulds. Gum arabic and isinglass are the two best substances for mixing with the powder. The gum and soap may be dissolved in cold water; but the isinglass must be cut in small pieces, put into hot water, and dissolved in Balneo Mariæ. These solutions should be well diluted with water, that they may be made to pass through a hair sieve in order to remove any foreign particles. As it is difficult to incorporate the paste with the isinglass, they must both be heated and mixed over a fire with a heat equal to that of boiling water. The paste should be well mixed before it is moulded. The best mode is to beat it with a pestle or mallet, and so pound it again for some time before it is put into the moulds. No soap must be employed but for those crayons in which gum is used. M. Lomet observes, that, as the crayons for which soap has been used are of a browner cast, it would appear that this combination abstracts the oxygen from a part of the red oxyde of iron, and gives it a brown tint by causing it to approach the state of martial æthiops. All the pastes prepared with oxyde of iron, even when pure water alone is used, become brown on the exterior surface as they dry; and still more sensibly when they are exposed to the action of the sun; which seems to arise from the light's abstracting a portion of the oxygen from the oxyde of iron.

The crayons, says our author, composed in this manner, have every good property that can be desired; they do not cost one-quarter of the common price; but it ought to be considered, that their composition requires great nicety in regard to the quantity of the materials, because the least variation occasions considerable difference in the quality of the paste. The best means to prevent waste, during the operation, will be to fix by experiments the quantity of water and of ingredients which the pounded redde and the solutions form before the mixtures are made. The following statements will serve this purpose. 1. Dry redde, or red oxyde of iron, 1 oz.; gum arabic dry, 18 grs. Crayons thus made are very friable, but they may be used for large designs. 2. Redde, &c. 1 oz.; gum 21 grains, will yield strong crayons, rather friable, but excellent for large drawings. 3. Redde, 1 oz.; gum 24 grains, or rather $25\frac{1}{2}$ gr., will give smooth and solid crayons, the best for common use. 4. Redde, 1 oz.; gum 27 gr. will produce soft firm crayons, fit for drawings which require delicacy and precision. 5. Redde 1 oz.; gum 30 gr., will yield very firm

crayons, fit for small drawings which are to be highly finished. 6. Reddie 1 oz.; gum 33 gr. will give very hard crayons, that cannot be used without some force. This is the greatest quantity of gum that can be employed in their composition; with more they would be useless. 7. Reddie 1 oz.; gum 22 gr.; white hard soap 30 grains. Crayons thus formed have a somewhat browner cast than the former. Their consistence is good, and they may be easily cut. All crayons with soap in their composition have this fault, that the strokes made by them have a shining appearance if the touches are repeated somewhat too strongly. These crayons perfectly resemble those of Desmarts. 8. Reddie, 1 oz.; singlass 56 grains, produce crayons of a brilliant colour, and excellent for use. With less singlass, they become brittle; with more, too hard. *Annal. de Chémie. No. 90. An. 7.*

CRAZE mill, or **CRAZING mill**, a mill in all respects like a grist-mill to grind corn, and is so called by the tinminers, who use it to grind their tin, which is yet too great, after trampling, and then it is trampled only.

CRAZEY, in *Agriculture*, a name not unfrequently applied in different districts to a weed in pasture lands, the (*Ranunculus repens*) or creeping crowfoot.

In the vale district of the county of Gloucester, it is, according to Mr. Marshall, a plant which is greatly esteemed as producing a valuable sort of pasture or herbage; while the common and bulbous species of it are considered as highly pernicious, particularly when made into hay. This distinction, he suggests, as doing the vale farmers of that district great credit, because it has been found by experience that these two latter species are extremely acid and noxious, having the tendency to produce an effect similar to that of caustic substances on the mouths of the animals which feed upon them; while the first species is perfectly mild and agreeable in its nature, so as to be highly beneficial to such cattle as feed upon it. This circumstance may lead the industrious and attentive farmer to extirpate the noxious species of this sort from his pastures, while he encourages the growth of the mild sort in them. See **CROWFOOT**.

CREALS, are a sort of jetties or weir-hedges, sometimes erected on the shores of rivers or the sea, for checking the force of the current or tide, in particular places, and occasioning a deposit of silt or mud, in place of a constant wear and encroachment of the water upon the land. *Smeaton's Reports, i. p. 4.*

CREAM, in *Rural Economy*, the name of the fat, oily, or unctuous fluid which rises on the surface of milk on standing, being specifically lighter than the other parts, and from which the well known article butter is made. See **BUTTER** and **DAIRYING**.

It is supposed by Dr. Anderson, that the separation of this oily fluid from milk takes place in consequence of an acid being formed, or that it is greatly promoted by it. Cream contains all the butter, some of the cheese, and also a portion of the other principles of the milk. Violent agitation converts the cream into thick froth; in which state it is called "whipped cream." The word is derived from *cremar*, which signifies the same; though in the lower Latin we find *crema lactis*.

A variety of elegant preparations, for the purpose of diet, are made from cream in other countries, especially in Germany; and in the northern part of this island a preparation is formed from it which affords an agreeable and nutritious article of food, and which is known under the title of *Corforth's Cream*, probably from the village of that name, where it is said to have been first made. It is usually sold through the streets of Edinburgh under the denomination of *sweet cream*.

The process by which it is prepared is this: a portion of skimmed milk, which has only acquired a moderately acid taste, is put into an upright wooden vessel, mostly the common upright churn, which being provided with spigot and fossat at the bottom, is placed in a tub of a sufficient size to hold it, when hot water is poured into the tub till it rises nearly to the height of the milk in the vessel which contains it. The whole is then covered with a cloth in order to preserve the heat. In a few hours the milk is found to be separated into two parts, the upper part having the consistence of thick cream, which has much the taste and appearance of good cream, being only moderately acid, while the other interior portion consists of a thin watery liquid, which is of a pungent acid taste, and is easily let off by means of the spigot. This fluid is then termed *coigg*. The cream is now fit for being made use of, and is scarcely capable of being distinguished from real cream. Its goodness, however, in a great measure depends upon the skill of the person who is employed in making it, as it is much affected by different circumstances of the process, as the degree of heat to which it is subjected, and the acidity of the milk. It is eaten in mixture with sugar as a great delicacy. The "clouted cream" of the west of England is well known.

CREAM of lime, is that matter which separates from lime-water by crystallization, during the evaporation of the water; forming on the surface a semi-transparent pellicle, which gradually thickens, till at length it subsides in the form of scales. This is a calcareous earth, which, having once lost its gas, fixed air, or carbonic acid, by calcination, is recombined with it after being dissolved in water, and exposed again to the air, and hereby becomes mild, crystallizable, unsoluble in water, and recovers its original state before calcination. See **LIME**.

CREAM of roses, a vegetable perfume, which M. Chaptal prepares by mixing equal parts of rose water, spirit of wine à la rose, and syrup of sugar; and colouring the mixture with the infusion of cochineal.

CREAM of lice, in *Rural Economy*, the name usually applied to a sort of wooden knife, twelve or fourteen inches in length, which is employed in removing the cream from the vessels in which it is contained.

CREAM of tartar, *cremor tartari*, is that part of the concrete acid of tartar which crystallizes first, and forms a pellicle on the surface of the water in which tartar has been boiled. This has been a general name comprehending this saline pellicle and the crystals of tartar.

The manufacture of this purified tartar has been chiefly carried on at Montpellier and at Venice. The following is the process at the former place, as it is stated by Chaptal. The tartar is dissolved in water, and suffered to crystallize by cooling. The crystals are then boiled in another vessel, with the addition of 5 or 6 pounds of the white argillaceous earth of Murviel to each quintal of the salt. After this boiling with the earth, a very white salt is obtained by evaporation, which is known by the name of cream of tartar, or acidulous tartrate of potash. M. Desmarts informs us, "*Journ. de Physique, 1771*, that the process used at Venice consists, 1st, in drying the tartar in iron boilers: 2. pounding it and dissolving it in hot water, which by cooling affords purer crystals: 3. redissolving these crystals in water, and clarifying the solution with whites of eggs and ashes. The process at Montpellier, says Chaptal (*El. Chem. vol. iii. p. 266*), is preferable to that at Venice; as the addition of the ashes introduces a foreign salt, which alters the purity of the product. The acidulous tartrate of potash crystallizes in tetrahedral prisms cut off slantwise. The salt is used by the dyers as a mordant; but its greatest consumption

sumption is in the north, where it is used at table as a feasoner. See TARTAR.

CRE'ANCE, in *Geography*, a small town of France, in the department of La Manche, 9 miles N.W. of Coutances. —Also, formerly a marquisate in the department of La Moselle, 7 miles E. of Metz.

CREANGE, or KRICHLINGEN, a town of Germany, in the circle of the Upper Rhine, and capital of a county; 38 miles W.S.W. of Deux Ponts.

CREASE-TYLES. See TYLE.

CREAT, in the *Mangee*, an usher to a riding master.

CREATION, in its strict and primary sense, denotes the causing of a substance or being to exist, which had no existence before; and, therefore, it implies no contradiction. That there is one underived and self-existing cause, from which all other beings derive their existence, and upon which they entirely depend, is a truth capable of incontestible demonstration. Consequently, all beings, except the first Cause, must have been produced, or brought into being, by the power and agency of the first Cause: not produced "out of nothing," as some have inaccurately expressed it, but out of nothing besides the immense and inconceivable fullness of the self-existent Being, who must have in himself the power and possibility of all being; though we cannot comprehend or conceive in what manner, or by what kind of agency, he creates or communicates existence to beings distinct from himself. The term *creation* is used, in a secondary and less proper sense, when any particular bodies are formed out of such a mass of matter as seems to be utterly unfit for that purpose; when such changes are made in any substance as are generally supposed to be above the power of creatures, and to belong to God alone:—thus God created fish and fowls out of the water, and man and beasts out of the earth; though the creation of the substance of water or earth, or the matter out of which they were made, is the original sense of the word. The Hebrew word, בְּרָא, (Gen. i. 1.) rendered *created*, has, it is said, chiefly on the authority of Maimonides, been considered as implying what theologians call "an absolute creation out of nothing." But this, it has been alleged, is not its appropriate meaning. It rather means to *fashion, form*, and *decorate* a matter already existing; and in this connection especially, it means to retrieve from a state of desolation, and to embellish this little spot of earth, so as to render it fit for its inhabitants. In this limited sense God is afterwards (ch. ii. 7.) said to have *created* man, not out of *nothing*, but out of the *dust* of the ground. Joshua (xviii. 15, 18.) bids the children of Joseph *create* to themselves a more ample possession, by cutting down the woods. Goliath (1 Sam. xvii. 8.) desires the Israelites to *create*, that is, *choose* or *prepare*, a proper champion to fight with him. In Numb. xvi. 30., 1 Kings xii. 33., and Nehem. vi. 8., it signifies to *devise*, as it is rendered in the cited passage of Kings; and the word *devise* would have been more proper in the other places. The word בְּרָא appears to have the same meaning, and, if etymology be regarded; to be the self-same word, with the Latin *parō*; and it is so rendered by Theodotus, ἑτοιμασθαι, Ezek. xxi. 19., and by the Chaldee Paraphrast, תַּתְקַן, Josh. xvii. 15.

Moses, in the *first* chapter of Genesis, has given us a summary account of the creation, at least of our earth, and its inhabitants; not, indeed, in a precise philosophical manner, but so as to give the men of the age in which he wrote just and affecting notions of this stupendous work of divine wisdom, power, and benevolence, so far as was necessary to the purposes of religion, and no further. It is sufficient, therefore, that his account is true, so far as it goes, and not in any respect inconsistent with the most accurate discoveries,

which have been made in later ages concerning the system of the universe, or any part of it.

In the beginning God created the heaven and the earth. (v. 1.) The *heaven* and the *earth* may comprehend either the whole universe, or all things visible and invisible. It does not therefore absolutely follow from this phraseology, that the whole universe was created all together at once, or at some one period of time: but the meaning of the expression may be, *at first*, referring to a prior epoch, or *originally*, when the universe was produced, it was brought into being by the sole power and wisdom of the almighty and eternal God. This is true, though the several parts of the universe may have been produced at different times, or at any distance of time from each other: and though God may be still creating new worlds in the immensity of space, which is not improbable, it is nevertheless true, that *in the beginning* of their existence, whenever that was, God created, and is still creating, them all. Thus, the sentiment which Moses seems to have been desirous of inculcating was, that the whole universe, whenever created, doth not exist by necessity or by chance; but had a beginning, and was created by the sole power of God. But as Moses here gives us a particular account of the formation of our earth, this phrase, *in the beginning*, may be understood proleptically with a reference to the six days' creation. Accordingly, the first thing which God did, in order to make the earth a suitable habitation for man, was to give to it and to the heavens the reciprocal appearances which they now have. Before that period, the earth was immersed in water, and covered with thick darkness, &c.: in a word, it was a chaos (see CHAOS); and with respect to it, the *heavens* existed not; that is, all those ethereal phenomena, which constitute what we call the *heavens*, were yet invisible. Such a change or revolution might justly be denominated a creation, according to the sense already given of the word בְּרָא. Upon the whole we may observe, that it seems to have been a current opinion among the ancient Jews and earliest Christians, that the world was created by God of pre-existing unshaped matter. The matter of which the earth was created, or rendered a habitable world, was "without form and void," (v. 2.) or a desolate waste, or in a state of desolation; that is, as some have supposed, a pre-existing earth reduced by some awful calamity to a chaotic state. (See CHAOS.) The earth was covered with deep water, and that water was covered with a thick darkness. But "the Spirit of God moved upon the face of the waters," *i. e.* the influences and exertions of the divine power actuated this dark confused mass, and digested and reduced its parts to the beautiful state and order in which we now behold them. Some have rendered רוח אלהים, a mighty wind, instead of the Spirit of God, which of course must be considered as the agent or instrument of divine operation. The first step in the recovery of the earth from its chaotic or desolate state, and the commencement of the six days' creation, was the production of light. This operation is expressed in the original with a beautiful conciseness and emphasis, אור היה-אור, which even Longinus has admired, and better rendered by Wielſſe than in our translation, "Be light; and light was." The light here mentioned, says a learned annotator (Dr. Geddes), may readily be conceived to have been a partial incipient light, which progressively penetrating the dense atmosphere that enveloped the sea-covered earth, so rarefied and expanded it in the course of three days, as to admit the clear and uninterrupted light of the celestial luminaries. The appearance of light three days before what some conceive to have been the creation of the sun has occasioned a difficulty, which indeed is not easily resolved upon this hypothesis. Some, as Dr. Taylor in his "Scripture

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Divinity," and the author of "Nature Displayed," have adopted the notion that light is a distinct substance from every other, and that it exists independently of the sun and other luminous bodies; and that these serve merely to excite it. Light, say they, exists in a state of expansion or diffusion through the whole universe, and at all times, by night as well as by day; and that, in our system, the sun is the great exciter, by which the substance of light is impelled, and becomes visible: and they add, that if no substance of light previously existed through the whole system, no light would appear, though 10,000 suns should at once be placed in our hemisphere. Hence it is argued, that the element or substance of light was created on the first day, and that the divine power alone might be the exciter, which made the light appear for the three first days of creation, until the sun, the instrumental exciter, was produced. "God," says the author of "Nature Displayed," "and not the sun, was the author and parent of light, and it was created by his almighty fiat, before there was a sun to dart it over one part of the earth, and a moon to reflect it on the other." (See also Patrick on Gen. i. 3, &c.) But waving any remarks on this hypothesis, it is more reasonable to conceive, as others have done, that the light, which was made to appear on the first day, was nothing more nor less than an emanation from the same sun, previously existing, that still enlightens us; and which, though it had not yet appeared in its full glory, yet shed sufficient light through the dense atmosphere to make the surface of the terraqueous globe visible. This was evidently the idea of Origen, and probably of Basil also. The former affirms, that no one of a sane mind can imagine, that there was an evening and a morning, during the three first days, without a sun: the latter ascribes the darkness that covered the earth, before the appearance of light, to the interposition of a dense body.

In order to dispose of the waters, which still overspread the face of the earth, and farther to attenuate the ambient air, God said, on the *second day*, (v. 6.) *Let there be an expanse*, רָקִיעַ from רָקַע, the primary meaning of which is expansion, outstretching, attenuation, elasticity; which are the properties of our atmosphere. The word στεγνυμα, used by the Greek translators, and the long prevailing idea that the heavens were a solid body, led latter interpreters to render it by the word "firmament;" and this, as well as στεγνυμα, is admissible, if by solidity be meant no more than that the fluid atmosphere has density or consistence sufficient to sustain the waters above it. This is the sense in which St. Basil understood the Greek term, although he had not the Hebrew to direct him to it. In his homily on the six days, he calls it a childish idea to suppose any other solidity in the firmament than that of a dense fluid; and he very justly observes, that as such the scripture every where represents the lower region of the heavens. The effect of this expansion was the separation of a part of the waters from the great mass. The lighter particles were exhaled, rarefied, and carried up into clouds, and formed the element of air. The water contained in those clouds is called the waters above the expanse, in contradistinction to those which still remained upon the earth.

Having now a purer atmosphere and a clearer sky, it is farther necessary to remove the water that still drenched the earth, and rendered it unfit for production. The *3d day* was assigned to this operation. (v. 9—13.) The waters were caused to retire into their destined receptacles, and left a portion of the chaotic mass so dry as to be fit for vegetation. Accordingly, the earth was vested in verdure, and replenished with all sorts of herbs and trees; with inherent powers to re-produce themselves, and continue their propagation to the end of time.

The next operation was performed on the *4th day*, which some have supposed to have been the creation of the sun and the moon, and also the stars; but it is not necessary to infer from the history, that these did not exist at various intervals before this period. God said, as the historian proceeds with his detail, (v. 14—19), *Let there be lights* (or luminaries) in the expanse of the heavens to illuminate the earth, and to distinguish the day from the night; i. e. let these luminaries appear; or let the luminaries, which are in the expanse of the heavens, be for the purpose of illuminating the earth, &c. The sun and moon are equally called *great luminaries*, from their apparently equal size, and not from the degree of light which they give.

On the *5th day* God created all the fishes and inhabitants of the waters, and also the fowls of the air, (v. 20—23.)

On the *6th day* God made animals, according to their kinds; cattle, wild beasts, and reptiles; terminating his works of creation with the formation of man in his own image, whom he constituted sovereign of the earth, and whom he provided with a suitable companion. See ADAM and EVE.

Many absurdities have been charged, both by ancient and modern writers, upon the Mosaic account of the creation; some of which, we conceive, might have been precluded by restricting this account to the formation of the earth into a habitable globe, without extending it to the creation of the sun, moon, and stars, which are here mentioned merely as they bear relation to the earth, and serve for its accommodation. According to this interpretation, the operation of the 4th day was not the creation of the sun, moon, and stars, but that of assigning to them their appropriate use, with respect to the new-formed earth. The whole passage describing this operation may be read, from a collation of different copies, in the following manner, (v. 14—18.):—*"Let there be luminaries in the expanse of the heavens, to illuminate the earth, and to distinguish the day from the night; let them, also, be the signals of terms, times, and years."* And let them be for luminaries in the expanse of the heavens, to illuminate the earth, (conjectured to be an interpolation:) And so it was. For God having made the two great luminaries (the greater luminary for the regulation of the day, and the smaller luminary for the regulation of the night), and the stars; he displayed them in the expanse of the heavens to illuminate the earth, to regulate the day and the night, and to distinguish the light from the darkness." Dr. Geddes, in a note on v. 14, "let there be luminaries, &c." observes, that it is not necessary to suppose that these luminaries were now first created. The text does not say so; and there are many strong reasons for believing the contrary. The objection, that may seem to arise from v. 16, "God made two great lights, &c." in our version, has no force but what it derives from theological system, and an ignorance of the Hebrew idiom. To *make* is often equivalent to *appoint* to a certain use. The luminaries, then, may have long existed, and most probably did long exist before this period; although now, for the first time, they shone forth in their full splendour on this little world of man. The opinion above stated, was maintained not only by the most learned of the Jewish rabbins, but by the most learned of the Christian writers. Origen affirms, as we have already observed, that "no man of a sound mind can imagine, that there were an evening and a morning, during the first three days, without a sun." St. Basil ascribed the darkness that covered the earth, before the appearance of light, to the interposition of an opaque body between it and the heavens. In this simple hypothesis, the whole Hebrew cosmogony is clear and consistent. It is plain that the light, if it emanated from the sun, or were excited by the sun, could not, even imperfectly, illuminate

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minate more than one half of the world at once; and that while that half was illuminated, the other would remain in darkness; and this is fitly called "separating the light from the darkness;" namely, by that ever-changing boundary the "horizon." But, in order to move this boundary, and to carry alternate light and darkness to every part of the globe, it was necessary either to make the sun revolve gradually round the earth, or the earth to turn gradually round its own supposed axis toward the sun; which latter motion we now know to be the fact. Light being thus separated from darkness by the aforesaid ideal boundary, they would follow one another without interruption, and produce successively those vicissitudes which we call "day" and "night;" two other terms, only, for "light" and "darkness;" and the former, being justly considered as the principal and most precious portion of time, an entire revolution of light and darkness was denominated "one day;" the "evening" being the term of "light," and the "morning" the term of "darkness."

By the "six days," in which the work of creation is said to have been performed, the generality of critics and commentators have understood, literally and strictly, so many days. Some by these days have understood as many years; some in order to favour a slow progressive creation, have made one day a period of 1000 years; and others, again, have thought the creation of the world to have been instantaneous, and that the number of days mentioned by Moses is intended only to assist our conception, who are best able to think of things in the order of succession. It has also been supposed, that the distribution of the work of creation into six days, followed by a day of rest, was designed to enforce the observance of a weekly sabbath, both as a day of religious worship, and as a day of solacing repose to the human, and even to the brute creation.

Many among the ancients and moderns have objected to a literal interpretation of the cosmogony of Moses. Whilst it has been a source of doubts and difficulties to the best commentators, it has furnished occasion of indecorous and misapplied raillery and ridicule to the enemies of revealed religion in all ages. Eusebius, by way of apology for the Mosaic account of the creation, says, (Præp. Evang. l. ii. 7.) "that it was not Moses's intention to give a philosophical account of the formation of the world, but to signify only, that it did not exist of itself, or by chance, but was the production of an all-wise and powerful creator." Cyril makes a similar reply to the scoffs of Julian, that Moses's view was to accommodate his story to the ignorance of the Jews; not to reason accurately on the origin of things, but to shew that there was one God, who created them all." (Julian, Oper. and Cyril Contr. vol. ii. l. 3. p. 50, &c. Ed. Lips.) Philo, (Cosmog. l. i. tom. i. p. 123.) calls it a "piece of rustic simplicity to imagine, that God really employed the labour of six days in the production of things; in which he is followed by Origen, Austin, Ambrose, &c. Accordingly, several ancient writers have adopted an allegorical interpretation. Josephus, in the first chapter of his "Jewish Antiquities," intimates "that the story of the creation was of the allegoric kind." Philo is evidently of the same opinion. Among the moderns, and especially among those who have been referred to the class of sceptical writers, the same allegorical interpretation has been generally adopted. See Blunt's "Oracles of Reason;" Toland's "Pantheisticon," and "Letters to Serena;" Burnet's "Archæologia (l. ii. c. 8, 9.);" Middleton's "Essay on the allegorical and literal Interpretation of the Creation and Fall of Man," in his "Works," vol. ii. p. 123—126. and his "Examination of Sherlock's Discourse on Prophecy," in his "Works," vol. iii. p. 192,

&c. Dr. Burnet, in particular, maintains, that the Mosaic account was merely a *fable*, though, according to his representation of it, a fable too absurd for a wise man, and much more for an inspired person to have formed. But surely there can be no reason for admitting this hypothesis, if the literal interpretation be capable of a philosophical explanation; more especially as Moses does not inform us where his fable ends, and where his true history begins, and as Christ and his apostles refer to the story of the creation and that of the fall (see FALL), inseparably connected with it, not as an *allegory*, but *true history*, 2 Cor. iv. 6. xi. 3. 1 Cor. xv. 45. Matt. xix. 4, 5. 1 Tim. ii. 13, 14. 1 Cor. xi. 9. Besides, it is not very natural to suppose that God would so solemnly, from mount Sinai, make the circumstance of a fable the foundation of the fourth commandment. Exod. xx. 11. Heb. iv. 3, 4.

A late biblical critic (see Dr. Geddes's *Critical Remarks*, vol. 1.), rejects both the literal narration and the pure allegory, and alleges that the Mosaic account is a most beautiful *mythos*, or philosophical fiction, contrived with great wisdom, dressed up in the garb of real history, adapted to the shallow intellects of a rude barbarous nation, and perfectly well calculated for the great and good purposes for which it was contrived; namely, to establish the belief of one supreme God and Creator, in opposition to the various and wild systems of idolatry which then prevailed; and to enforce the observance of a periodical day to be chiefly devoted to the service of that creator, and the solacing repose of his creatures. In fact, says this writer, what stronger motive could be urged to preserve a people from idolatry, than by shewing, in so minute a detail, that all the worship-objects of the surrounding nations were themselves but mere creatures, the great celestial luminaries (most probably the first objects of adoration) not excepted? He had, no doubt, particularly in view the idolatry of Egypt; where, as Bossuet elegantly says, "Tout étoit Dieu, excepté Dieu même; et cette Terre, qu'il avoit fait, pour y manifester sa gloire, sembloit être devenue un temple d'Idoles." (Disc. sur l'Hist. Univ.) Beside the sun, moon, and stars, they adored the fishes of the sea, the birds of the air, the animals of the earth, and even the herbs of the field, radishes, leeks, and onions.

• O sanctas gentes! quibus hæc nascuntur in hortis
Numina!"

It was then of the utmost importance to persuade the Israelites, who had, during their stay in Egypt, been more or less contaminated by those idolatrous rites, that every plant of the field, fish of the sea, bird of the air, and beast of the earth; the whole visible world, in short, was the production of a superior BEING, to whom alone divine worship could be due. In particularising the greater quadrupeds הבהמה, and the great sea-monsters, תנין, it is supposed that he alluded in the former, to the worship of Apis in the form of a bull, and in the latter to the crocodile, which, in some parts of Egypt, was held in the greatest veneration. The hypothesis, says Dr. Geddes, of a mere poetical mythos, historically adapted to the senses and intellects of a rude unphilosophical people, will remove every obstacle, obviate every objection, and repel every sarcasm; whether it come from a Celsus or Porphyry, a Julian or a Frederic, a Boulanger or a Bolingbroke. See *Theory of the EARTH, FALL of Man, and GENESIS.*

CREATION, *Epocha of.* See EPOCHA.

CREATION, in a figurative sense, is used to denote a change of character and state. Thus the Jews, whom God by his providence rescued from the most abject slavery, and advanced to a new and happy state of being, attended with distinguishing

distinguishing privileges, enjoyments, and marks of honour, are said to have been created, made, formed, and begotten. If. xliii. 1. 7. 15. 21. xlv. 1. 2. 21. 24. In consequence of this creation, they received a being or existence. If. lxiii. 10. 1 Cor. i. 28. Thus also, when G d formed believing Jews and Gentiles into one body, and brought the Gentiles out of darkness and idolatry into a new and happy state of existence, he is said to create and make them, and they are his work and workmanship. Eph. ii. 10 15. Col. iii. 10. Jam. i. 18. And as God hath created us Christians, and made us to live, we have received a new existence. 1 Cor. i. 20. 2 Cor. v. 17. Accordingly, the new state of life into which Christians are brought under the gospel, by its doctrines and motives, and the agency of a divine spirit, is called the new creation in Christ Jesus. Many passages might be cited, in order to shew that the term creation is applied, in a moral or spiritual sense, to a change of principles, character, and state. As ignorance, vice, and guilt are, if we may so express it, the chaos of an intelligent, moral, accountable, and immortal being, a recovery from this state to knowledge, holiness, pardon, and hope, may be fitly denominated a new creation. And as God is the primary cause of this change, and we are the subjects of it, he is our creator, and we are his creatures. Christianity, the appointed means and powerful instrument of producing it, is, in reference to its effects, a new creation.

CREBILLON, PROSPER JOLYOT DE, in *Biography*, a celebrated French tragic poet, was born at Dijon the 15th of February, 1674, educated at the College Mazarin in Paris, and brought up for the bar. The lawyer, with whom he was placed for that purpose, observing the impetuosity of his passions, urged him to attempt dramatic compositions. His two first tragedies were "Idomenée," and "Atrée." Both met with great success. In the midst of his triumphant career as a dramatic poet, he married an apothecary's daughter, against the consent of his father, who disinherited him; but re-established him in his rights a short time before his death, which happened in 1707. Crebillon, however, was not benefited by this circumstance; the fortune of his father being hardly able to pay his debts. A few years after, the death of his wife added to the troubles of the poet, who continued involved in distress, until he obtained the employment of censor of the police, and, in 1731, a place in the French academy. The speech which he delivered at his reception was in verse.

Crebillon's manner of life was extremely singular. He slept little, and lay very hard: he was always surrounded with about thirty dogs and cats; and used to smoke tobacco, to keep his room sweet against their exhalations. He made a jest of physic and physicians; and was for a long time afflicted with the erysipelas in his legs, which brought him at last to his grave, on the 17th of June, 1762, when he was 88 years old.

Crebillon was of a cheerful temper. Being one day asked, in a large company, which of his works he thought the best? "I don't know," answered he, "which is my best production; but this (pointing to his son, who was present) is certainly my worst."—"It is," replied the son, with vivacity, "because no Carthusian had a hand in it:" alluding to the report, that the best passages in his father's tragedies had been written by a Carthusian friar, who was his friend. Terror is the predominant character of Crebillon's tragedies. Being asked for the reason of this peculiarity, he replied, "I had no choice: Corneille has exhausted heaven; Racine, the earth; I had nothing left but hell, and I have thrown myself headlong into it." His "Atrée" was performed eighteen nights running. An Englishman, who was at its first representation, observed that this tragedy was

better calculated for the London than for the Paris stage; and that, although an Englishman, he had shuddered with horror at the cup-full of blood. "Electre" had less success; "Rhadamille," in 1711, was performed thirty times, and ran through two editions in a week; "Xerxes," in 1714, had but two representations; "Semiramis," in 1717, was much criticised; "Pyrrhus" had some success when it came out, but failed when it was again performed in 1778; "Catilina" was performed in 1749, when Crebillon was 72 years old: and he wrote the "Triumvirate," his last tragedy, when he was 80 years of age.

Crebillon's style is unequal and incorrect: he has been much criticised on that account by Boileau, who witnessed his first successes, and by Voltaire, to whom he was opposed as a rival for dramatic fame. In order to remove Voltaire from court, Crebillon was recommended as a superior poet to Madame de Pompadour. Hearing that he was poor, this lady obtained for him a pension of 2400 French livres. When Crebillon went to thank his patroness, she received him uncommonly well, being struck with his venerable and interesting figure; but she was in bed, and at the instant the old poet was kissing her hand, the king entered the room. "Alas! Madame!" exclaimed Crebillon, "the king has surprised us: I am undone." This exclamation, from the mouth of an old man of 80, diverted Louis XV. exceedingly. The monarch zealously patronized Crebillon ever since, got his works printed at the press of the Louvre, and, after his death, erected a marble monument to his memory in the church of St. Gervais, where his remains are interred.

The best editions of Crebillon, besides that of the Louvre, in 2 vols. 4to., are that of 1759, in 2 vols. 12mo.; that of 1772, in 3 very neat volumes, small 12mo.; that of 1785, in 3 vols., 8vo., with cuts; and the last Paris edition by Desray, published a few years ago.

Laharpe, in his "Cours de Littérature," pronounces that Crebillon, though a bad writer, will maintain his station among men of genius, but cannot be ranked in the class of masters and models. Marmontel calls his verses *après et durs*, stiff and harsh. Nouveau Dictionnaire Historique. Mémoires de Marmontel.

CREBILLON, CLAUDE PROSPER JOLYOT DE, son of the poet, was born at Paris on the 12th of February, 1707, and died on the 12th of April, 1777, at the age of 70. If his father has sometimes been called the Æschylus of the French, he may be denominated their Petronius. With a masterly hand he has delineated in his novels the vices, follies, and levity of the French. His style is rather defective; but his works betray an intimate knowledge of the most hidden recesses of the human heart. He lived with his father as with a friend and brother. His marriage with an English woman, of which the poet disapproved, caused but a very slight alteration between them.

The principal works of Crebillon the Younger are, "Tangai & Néadarné;" "Les Egaremens du Coeur et de l'Esprit;" "Le Sopha;" and "Les Lettres Athéniennes." A complete edition of them has been published in 1779, in 11 vols., 12mo. Nouveau Dictionnaire Historique.

CRECCA, in *Ornithology*, the ANAS crecca, with a green spot on the wings, and a white line above and below the eyes; the common teal of English writers. See ANAS and TEAL.

CRECCHIO, in *Geography*, a town of Naples, in the province of Abruzzo Citra; 10 miles E. of Civita di Chieti.

CRECY, or, as it is improperly spelled in English, *Cressy*, a small town of France, in the department of the Somme, 36 miles N.W. of Amiens, and 120 N. of Paris, chief place of a canton, in the district of Abbeville, with 1378 inhabitants.

habitants. The canton has 25 communes, and a population of 12,317 individuals, upon a territorial extent of 217 kilometres and a half. There was anciently near this place a royal seat, called *Crécy en Pontbieu*, *Crethiacum in Pontivo*, famous for the battle which was fought here, in 1346, between Philippe de Valois, king of France, and Edward, king of England.

The king of France, hearing that Edward had made a stand at this place, and dreading nothing so much as the escape of the English, began the march of his great army from Abbeville early in the morning of the 26th of August, and continued it for several hours with great eagerness; but was advised not to engage, on account of the fatigue of his troops. His orders for halting were, however, not obeyed. Edward had employed the forenoon in drawing up his army in three lines. The first, which consisted of 800 men at arms, 4000 English archers, and 600 Welsh foot, was commanded by his heroic son, the prince of Wales, assisted by the earls of Warwick and Oxford; the second line, composed of 800 men at arms, 4000 halbardiers, and 2400 archers, was led by the earls of Arundel and Northampton; the last line, or body of reserve, in which were 700 men at arms, 5300 billmen, and 6000 archers, was ranged along the summit of the hill, and conducted by the English king in person. When the army was completely formed, Edward rode along the lines, and by his words and looks inspired his troops with the strongest hopes of victory. He then commanded the cavalry to dismount, and the whole army to sit down upon the grass in their ranks, and refresh themselves. As soon as the French army came in view, they sprang from the ground, ready to receive them.

The king of France, assisted by the kings of Bohemia and Majorca, the dukes of Lorraine and Savoy, and several other sovereign princes, with the flower of the French nobility, laboured to restore some degree of order to his large army, and drew it up also in three lines, but very indistinctly formed. The first line was commanded in chief by the king of Bohemia; the second by the earl of Alençon, brother to the king of France; and the third by the king in person. Each of these lines contained a greater number of troops than the whole English army.

The battle was begun about 3 o'clock in the afternoon by a body of Genoese cross-bowmen in the French service, who, letting their weapons fly at too great a distance, were presently routed by a shower of arrows from the English archers. The earl of Alençon, after trampling to death many of the flying Genoese, made a furious attack on the corps commanded by the prince of Wales. The earls of Arundel and Northampton advanced with the second line to sustain the prince. The battle raged for some time with uncommon fury. Anxious for the safety of the prince, the earl of Warwick sent to intreat the king to advance with the third line. But Edward, who had taken his stand on the top of the hill, from whence he had a full view of both armies, asked the messenger whether his son was unhorsed, wounded, or killed; and being answered that he was unhurt, and performed prodigies of valour: "Go, then," said the king, "and tell my son and his brave companions, that I will not deprive them of any part of the glory of their victory." This flattering message inspired the prince and his troops with redoubled ardour. The king of Bohemia, the earl of Alençon, and many other noblemen, being slain, the whole first and second line of the French were put to the flight. Undismayed at the slaughter of his troops, and at the fall of so many princes, the French king advanced to the charge with the line under his immediate command. But it soon shared the same fate with the other two.

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Philippe, unhorsed and wounded, was carried off the field by John de Hainault. Of his mighty army, which at the commencement of the battle consisted of 120,000 men, only five knights and about 60 soldiers fled with him. Such was the celebrated victory of Crécy, the greatest ever gained by any king of England. Henry's History of England.—There is another Crécy, a small town of France, in the department of Seine and Marne, in the district of Meaux, with 1007 inhabitants. It is situated 3 miles S. of Meaux, and is the chief place of a canton, which, upon a territorial extent of 145 kilometres, has 23 communes and 12,725 inhabitants.

CRÉCY *sur Serre*, a small town of France, in the department of Aisne, on the river Serre, which flows into the Oise, 9 miles N.W. of Laon, and 15 miles S. of Guise. It is the chief place of a canton, in the district of Laon. Its population amounts to 1862 individuals. The canton itself has 22 communes, 10,695 inhabitants, and a territorial extent of 167 kilometres and a half.

CRE DAN HEAD, a cape of Ireland, on the west coast of Waterford harbour. W. long. 6° 59'. N. lat. 52° 10'.

CREDDY, a river of England, which runs into the Ex, near Exeter.

CREDENCE TABLE, from *Credentia*, low Latin, "Tabula seu mensa in qua vasa ad convivia reponuntur," Du Cange; a small table placed on the right hand side of the high altar, in Roman Catholic churches, for the purpose of holding several articles made use of in the service of the mass. *Cæremoniale Episcop. lib. i. cap. 12.*

CREDENTIALS, letters of credit and recommendation; especially such as are given to ambassadors, plenipotentiaries, &c. sent to foreign courts.

CREDI, DI, LORENZO, in *Biography*, a Florentine painter, born in 1452. His family name was *Sciarpelloni*; but being placed, when young, under a goldsmith called Credi, he assumed that name, according to the ancient Florentine custom. He afterwards entered the study of And. Verrochio, and, with the exception of his disciple, the celebrated Lionardo da Vinci, may be considered the best scholar of that master. His works were designed with great diligence, and painted with a delicacy and neatness which are peculiar to him; inasmuch that his picture of the S. S. Nicolo and Giuliano, in the church of Sta. Maria Maddalene at Florence, is adduced by Vafari as an example of clear and beautiful execution. He sometimes is said to have copied the works of Lionardo with such wonderful exactness, that the original could not be distinguished from the imitation. His style appears to unite something of the early manner of Da Vinci with that of Pietro Perugino, the other friend of Credi; but he never attained the boldness and breadth of chiaro-scuro which characterized the works of Lionardo, although he continued to live many years after the decease of that great artist. His most celebrated picture is the Nativity, in the church of St. Chiara at Florence. Several circular pictures of the Holy Family, by this artist, are dispersed in that city, which unite a considerable portion of grace to some originality of design. He died in 1530. Lanzi. Orlandi.

CREDIBILITY, a quality in objects whereby they become fit to be believed. See FAITH.

A thing is said to be credible, which is not apparent of itself, nor is certainly to be inferred either from the cause or effect: and yet has the attestation of a truth. Things which appear immediately true, as the whiteness of snow, or that the whole is equal to its parts; are not said to be credible, but evident. Those to which we only give our assent in virtue of some competent authority or testimony

of others, are, by the schoolmen, said to be credible. In the Philosophical Transactions we have a mathematical computation of the credibility of human testimony. See EVIDENCE.

CREDIT, in *Commerces*, a mutual trust or loan of merchandize or money, on the reputation of the probity and solvability of a dealer.

Credit is either *public* or *private*; the latter being that of individuals, and the former belonging to individuals connected by social intercourse, and forming communities or nations.

Every trader ought to have some estate, stock, or portion of his own, sufficient to carry on the traffic he is engaged in: they should also keep their dealings within the extent of their capital, so that no disappointment in their returns may incapacitate them from supporting their credit. Yet traders of worth and judgment may sometimes lie under the necessity of borrowing money for carrying on their business to the best advantage; but then the borrower ought to be so just to his own reputation and to his creditors, as to be well assured that he has sufficient effects within his power, to pay off his obligations in due time. But if a trader should borrow money to the extent of his credit, and launch out into trade, so as to employ it with the same freedom as if it was his own proper stock; such a way of management is very precarious, and may be attended with dangerous consequences. Merchants ought never to purchase their goods for exportation upon long credit, with intent to discharge the debt by the return of the same goods; for this has an injurious influence on trade several ways: and if any merchant has occasion to make use of his credit, it should always be for the borrowing of money, but never for the buying of goods; nor is the large credit given to wholesale traders, a prudential or justifiable practice in trade.

The public credit of a nation is said to run high, when the commodities of that nation find a ready vent, are sold at a good price, and when dealers may be safely trusted with them: also when lands and houses find ready purchasers; when money may be easily obtained for commercial purposes, the promotion of important objects of a national kind, or the service of the state; and when it may be borrowed either at a low interest or without difficulty on higher terms; when people think it safe and advantageous to venture large stocks in trade: and when notes, mortgages, &c. will pass for money. See BANK and PAPER MONEY.

CREDIT, *letters of*, are those given to persons in whom a merchant, &c. can trust, to take money of his correspondent abroad, in case they happen to need it.

CREDIT is also used for the currency which paper, or bills, have with the public, or among dealers.

In this sense, credit is said to rise, when in negotiating the shares of a company, they are received and sold at prices above *par*, or the standard of their first creation.

Discredit is opposed to credit, and is used where money, bills, &c. fall below *par*. These terms, however, are used in a more lax sense, when they are applied to the rise or fall of the shares or stocks of any public company, whether they were at, above, or below *par*. The gage of public credit in England was formerly the rise and fall of its public or national funds; but since the plan of annexing to any capital borrowed and funded, a certain sum designed to form a sinking fund for liquidating or reducing it, has been adopted by modern policy, and the gradual increase of this fund is regularly applied to the purchase of floating stock, the funds admit of very little advancement or de-

pression; and of course they are a less decisive criterion of the state of public credit. See NATIONAL DEBT and FUND.

CREDIT was also anciently a right which lords had over their vassals; consisting in this, that during a certain time they might oblige them to lend them money.

CREDITON, commonly called KIRTON, in *Geography*, is an ancient and populous town in Devonshire, England, situated near the river Creedy, between two hills; one of which rises gradually towards the north, the other, with a quicker ascent southward, overlooks the tops of the houses. The town is divided into two parts, distinguished by the appellations of the East Town and the West; the latter was formerly of much greater extent than at present, upwards of 450 houses having been consumed by fire in the year 1743; and when in some degree restored, many of the new buildings, with the market house and shambles, were again destroyed by a second fire in 1769, but have since been rebuilt in a handsome manner. Crediton was probably of considerable note in the Saxon times; twelve bishops having successively their seats here between the years 924 and 1049, when the see was removed to Exeter. The old church or cathedral was situated, according to Ireland, on the spot which is now occupied by houses on the side of the burial ground; but no part of it is now remaining.

From the time of the removal of the see, there continued a chapter, under the peculiar patronage and jurisdiction of the bishops of Exeter. After the dissolution, the site of the college was granted by Henry VIII. to Elizabeth countess of Bute and sir Thomas d'Arcy; but the church with its appropriate lands was given by Edward VI. to the master and governors of the free grammar school, which about that time was established in this town. The present church is a very spacious structure, built in the form of a cross, with a tower rising at the intersection of the nave and transept, and supported by four pillars of uncommon magnitude. The interior displays particular neatness, being furnished with a raised floor, and covered with pews of the best wainscot. The east and west windows are very large, and are adorned with rich tracery. Besides the grammar school above-mentioned, here are a free English school, a charity school, and two Sunday schools. Crediton is 180 miles W. from London; contains 1503 houses, and 4929 inhabitants: many of whom derive their support from the manufacture of serges, which is carried on here to a considerable extent. There are three annual fairs; and a weekly market on Saturdays where vast quantities of wool, yarn, and all kinds of provisions are sold. The town is governed by a Portreve; and was once represented in parliament, 35 Edward I.

A degree of celebrity attached to it, as being the birth place of Winiford, surnamed Boniface, archbishop of Mentz, who flourished in the 8th century. "History, &c. of Devonshire, by R. Polwhele," fo.

CREDITOR, a person to whom any sum of money is due, either by obligation, promise, or otherwise.

The laws of the Twelve Tables, which were the foundation of the Roman jurisprudence, allowed the creditor to tear or cut his debtor to pieces, in case he proved insolvent. See BANKRUPT.

CREDITOR, in *Book keeping*. See BOOK-KEEPING.

CREDO, *the grand*, in *Geography*, is the name given to the southern part of Mont blanc, between Gex and Bourg, in the department of the Ain.

CREDULITY denotes a weakness of mind, by reason of which a person yields his assent to propositions or facts, before he has considered their evidence. See EVIDENCE.

CRÉE, in *Geography*, a river of Scotland, which rises

rises in the S.E. part of Ayrshire, separates Kircudbright from Wigtownshire, and discharges itself into Wigtown bay. There is a small village on the E. side of Wigtown bay, near the mouth of the river Cree, which is navigable some miles higher to Carty port, near Newton-stewart, a considerable village, pleasantly situated in a fertile country, abounding with all the real necessaries of life, particularly extensive woods of full-grown trees, which overhang the banks of the Cree, and the waters which fall into it from the North.

CREE Indians, Indians of North America, who occupy the district W. of little lake Winnipeg, and fort Dauphin, in upper Canada.

CREECH, THOMAS, in *Biography*, chiefly celebrated for his poetical translations, was born in 1659 at Blandford in Dorsetshire. He was inducted into grammar learning at the free-school of Sherborne, and from thence he went to Wadham college, Oxford. In 1683 he took his degree of M.A., but he had already published his translation of Lucretius, by which he established his reputation as a scholar; and on account of which he was probably elected probationer-fellow of All-souls college. Creech translated many other pieces from the ancient writers; as parts of Ovid and Virgil; the greater portion of Horace, one of Juvenal's satires, and the Idylliums of Theocritus. This last he dedicated to his old master who had instructed him in the knowledge of the languages. In the year 1699 he was presented to the rectory of Welwyn in Hertfordshire, but put an end to his life before he took possession of it. It is not perfectly ascertained what led to this fatal catastrophe; some have thought it the effect of disappointed love, but others with more reason imputed it to certain pecuniary embarrassments, and the cold reception which he met with from a friend to whom he applied for assistance. He was found hanging in his study three days probably after he had committed the rash action. He is said to have been of a very morose temper, which engaged him in many disputes. *Biog. Brit.*

CREECH-Hill, in *Geography*, a remarkable eminence in the island of Purbeck in Dorsetshire. In the government trigonometrical survey in 1794 the situation of the ancient barrow on this hill was determined, by an observation from Nine Barrow down, distant 24,163 feet and bearing 83° 0' 57" S.E. from the parallel to the meridian of Dunnose, and another from Wingreen, distant 125,534 feet; whence is deduced its latitude 50° 38' 1".7 N., and its longitude 2° 6' 14".9, or 8" 25' W. of Greenwich.

CREED, CREDO, a short or summary account of the chief articles of the Christian faith; thus called from the first word thereof in Latin, *credo, I believe*. See *SYMBOL*.

The principal of these creeds are the *Apostles'*, the *Athanasian*, and the *Nicene*.

CREED, Apostles', is so called, because for many ages it was believed to have been framed by the apostles before they left Jerusalem. The first person who gave this account of its original was St. Ambrose, towards the latter end of the fourth century; in which he is followed by Rufinus, Jerom, and several others; and some have even asserted, that each apostle supplied his particular article; and according to the number of the Apostles, the creed was divided into 12 articles, one article being assigned to each Apostle. (See *SYMBOL*.) But there are many reasons why this account cannot be admitted: if a creed of such high authority had existed in the Christian church, it is reasonable to suppose that it would have been mentioned by St. Luke in the history of the Acts of the Apostles, or by

some of the earlier writers in the four first centuries, before the time of St. Ambrose; that it would have been referred to as a standard of doctrine by the more ancient councils; and that it would have superseded the necessity of composing new creeds, which was done on many occasions. Besides, the several copies of this creed, of which the principal are the vulgar or Roman, the Aquileian, and the Oriental, differ from one another in many articles; and this difference cannot easily be reconciled with the notion, that it was framed by the apostles, and transmitted from them to their successors. To which we may add, that some of the articles contained in it were inserted in opposition to errors that sprung up in the Christian church, long after the time of the apostles. However, this creed is a very ancient composition, and upon the whole an unexceptionable summary of the Christian doctrine, and much superior to compositions of a similar kind of later date. It might in part have been transmitted down from the apostles, and afterwards gradually enlarged in its present form as heresies arose and occasion required. Although the exact form of the present creed cannot pretend to be so ancient as the time of the apostles by 400 years; yet a form not very different from it was used long before, as we learn from Irenæus and Tertullian. It seems, however, that, in the first ages of Christianity, every church was at liberty to express the fundamental articles of the Christian faith in any manner, which was thought fit *pro re nata*, or as occasion offered. After its introduction, this creed was received in all ages with the greatest veneration and esteem, and for several centuries, such deference was paid to it, that it was not only used at the administration of baptism, but it was usually, if not always, read in every public assembly as the standard and basis of the Christian faith, to which the whole congregation testified assent by saying "Amen." The primitive Christians, however, affected an unaccountable secrecy in their faith and worship, and, therefore, did not in their assemblies publicly recite the creed, except at the times of baptism, which, unless cases of necessity occurred, were only at Easter and Whitsuntide; so that the constant repetition of the creed in the church was not introduced till a long time after our Saviour's incarnation. The repetition of a creed at every assembly was appointed in the eastern church by Timothy, archbishop of Constantinople in the reign of Anastasius, who died A.D. 521; but before this time the creed was only repeated on the day immediately preceding Good Friday, and its repetition on that day was first appointed by the 46th canon of the council of Laodicea. In the western churches the general and constant reading of the creed does not seem to have prevailed, till almost 590 years after Christ, when the third council of Toledo enjoined, that the creed should be repeated with a loud voice every Lord's day. The creed thus appointed to be read, both by archbishop Timothy and the council of Toledo, was the Nicene or Constantinopolitan creed, which, for reasons peculiar to that age, in some measure eclipsed the Apostles' creed, although in a little time this latter recovered its former value and estimation. Lord King's Crit. Hist. of the Apostles' Creed.

CREED, Athanasian, has been falsely attributed to ATHANASIVS, bishop of Alexandria, who lived and wrote in the fourth century, and who died A. D. 373: it is neither mentioned nor referred to in any of his genuine works; nor is it likely that he should himself compose a creed, as he and all the orthodox divines of those times constantly refer to the Nicene creed as the standard of their faith. No notice is taken of it by writers who immediately succeeded him; it was never

appealed to for the decision of the controversy relating to the procession of the Spirit between the Eastern and Western churches, in the seventh and ninth centuries; it condemns the Macedonian, Nestorian, and Eutychian heresies; but as it is never mentioned in those controversies, we may conclude that it did not then exist: nor is it quoted, say some, till one thousand years after Christ. Accordingly, the learned Dr. Cave says (Hist. Lit.) that it never was cited till about the year 800, above 400 years after the death of Athanasius, and that it was not received in the church till so very late as about the year 1000. Indeed Dr. Waterland, in his "History of the Creed," intimates, that it was written by some person about 60 years after the death of Athanasius; but he allows that it did not appear in the churches till a century or two after. It had never the sanction of any council, and it is doubtful whether it was ever admitted into the Eastern church. Fabricius is of opinion that it was first written in Latin long after the sixth century, and afterwards translated into Greek. It is appointed to be read in the service of the church of England thirteen times in the year. Vossii Diss. de Symbolis. Fabr. Bib. Græc. vol. v.

As to the uncharitable and damnable clauses of this creed, they seem to have been reprobated by the most eminent men in the church, and even by those who profess to believe the doctrines that are contained in it. It seems to have been one of the principal reasons of Mr. Chillingworth's long persisting in his refusal to subscribe the 39 articles; and he was one of the brightest ornaments and ablest defenders (says Dr. Clarke) the protestant cause ever had. Of the damning sentences in this creed he observes, that they are not only false, but in a high degree presumptuous and schismatical. "The account given of Athanasius's creed," says the excellent archbishop Tillotson, in a letter written from Lambeth, Oct. 23, 1694, to a right reverend prelate, "seems to me nowise satisfactory; I wish we were well rid of it." The learned bishop Taylor in his "Liberty of Prophecy," (Sect. ii. § 36.) has the following observation respecting it: "If it were considered concerning Athanasius's creed, how many people understand it not, how contrary to natural reason it seems, how little the scripture says of those curiosities of explication, and how tradition was not clear on his side for the article itself, much less for those forms and minutes: it had not been amiss if the final judgment had been left to Jesus Christ: and indeed to me it seems very hard to put uncharitableness into the creed, and so to make it become as an article of faith." "It certainly is to be lamented," says Dr. Tomline, the present bishop of Lincoln, in his "Elements of Christian Theology," (vol. ii. p. 220.) "that assertions of so peremptory a nature," referring to the damnable clauses, "unexplained and unqualified, should have been used in any human composition." "I am ready to acknowledge (p. 222.) that, in my judgment, notwithstanding the authority of former times, our church would have acted more wisely, and more consistently with its general principles of mildness and toleration, if it had not adopted the damnable clauses of the Athanasian creed. Though I firmly believe that the doctrines themselves of this creed are all founded on scripture, I cannot but conceive it to be both unnecessary and presumptuous to say that "except every one do keep them whole and undefiled, without doubt he shall perish everlastingly." Dr. Horsley, the late bishop of St. Asaph, avowed similar sentiments.

CREED, *Nicene*, was composed and established as a proper summary of the Christian faith by the council at Nice, A. D. 325, against the Arians. This is also called the *Constantinopolitan creed*, because it was confirmed with some few alterations by the council of Constantinople, A. D. 381. The greater

part of this creed, viz. as far as the words "Holy Ghost" was formed and settled by the council of Nice; which council also added the following clause: "The holy catholic and apostolic church anathematizes those who say there was a time when the Son of God was not, and that before he was begotten he was not, and that he was made out of nothing, or out of another substance or essence, and is created, or changeable, or alterable." (Socrat. Ecc. Hist. i. 8.) Our church hath dropped the anathematizing clauses at the end; and one cannot help wishing, says Dr. Jortin, that the Nicene fathers had done the same: the rest of this creed, after "Holy Ghost," was added at the council of Constantinople, except the words "and the Son," which follow the words "who proceedeth from the father;" and they were inserted A. D. 447. The addition made at Constantinople was occasioned by the denial of the divinity of the Holy Ghost by Macedonius and his followers; and the creed thus enlarged was immediately received by all orthodox Christians. The insertion of the words "and the Son" was made by the Spanish bishops, and they were soon after adopted by the Christians in France. The bishops of Rome for some time refused to admit these words into the creed; but at last, in the year 883, when Nicholas I. was pope, they were allowed, and from that time they have stood in the Nicene creed, in all the western churches, but the Greek church has never received them.

These three creeds are enjoined by the eighth article of the church of England, "thoroughly to be received and believed, for they may be proved by most certain warrants of Holy Scripture;" they are used in the public offices of the church; and subscription to them is required of the clergy, and as the law formerly stood of dissenting teachers properly qualified under the toleration act. See TOLERATION.

CREEK, a part of a haven where any thing is landed from the sea. So many landing places as there are in a harbour or port, so many creeks there are.

It is also said to be a shore or bank whereon the water beats, running in a small channel from any part of the sea; from the Latin *crepido*. This word is used in the Mat. 4 Hen. IV. c. 20. and 5 Eliz. c. 5.

CREEK *Moor*, in Dorsetshire, is a wharf at the northern extremity of Pool harbour, in the road between Pool and Lyones Mill. See CANAL.

CREEKS, or CREEK *Confederacy*, an Indian nation of America, so called from the creeks and rivulets with which their country abounds, and known also by the names of *Muskogulges*, and *Muskogees*, which inhabits the middle parts of Georgia. The country they claim is bounded N. by the 34th degree of latitude, and extends from the Tombigbee river to the Atlantic ocean, though they have by different treaties ceded a part of the tract on the sea-coast to the state of Georgia. The western line of their settlements and villages is formed by the Coosa river, and its main branches; but their hunting grounds extend 200 miles further to the Tombigbee, which separates their country from the Chactaws. Their territory is naturally divided into three districts, viz. the Upper Creeks, Lower and Middle Creeks, and Seminoles. The upper district includes all the waters of the Tallapoosie, Coosahatchee, and Alabama rivers, and is called the Abbaeoos. The lower or middle district includes all the waters of the Chatahoosie and Flint rivers, down to their junction; and although occupied by a great number of different tribes, they are altogether called Cowetauleas, or Coweta people, from the Cowetan town and tribe, the most ancient and warlike of any in the whole nation. The lower or southern district takes in the river Appalachicola, extends to the point of East Florida, and is called the country of the

C R E E K S.

the Seminoles. The Creeks or Muskogulges reckon 55 towns besides villages; and they have established a powerful empire upon the ruins of that of the Natchez. After their emigration from the west, beyond the Mississippi, their original native country, they first settled on the Oakmulge fields; and gradually subduing their surrounding enemies, they strengthened themselves by admitting into their confederacy the vanquished tribes; thus they rendered themselves victorious over the Chactaws, and formidable to all the nations around them. The smallest of their towns contain from 20 to 30 houses, and some from 150 to 200. These houses stand in clusters of 4, 5, 6, 7, and 8 together, irregularly distributed along the banks of the rivers or small streams. Each cluster of houses contains a clan, or family, of relatives, who eat and live in common. Each town has a public square, hot-house and yard near the centre of it, appropriate to various public uses. The principal towns of the upper and lower Creeks that have these public squares, beginning at the head of the Coosa, or Coosa Hacha river, are Upper Utalas, Abbacoochees, Natchez, Coosas, Oteetooheenas, Pinc Catches, Pocomtullahases, Weeokes, Little Talafsie, Tuskeegees, Coofadas, Alabamas, Tawafas, Pawactas, Autobas, Auhoba, Weelumpekes Big, Weelumpekes Little, Wacacoys, Wacksoy, and Ochees; the following towns are in the central, inland, and high country, between the Coosa and Tallapoosie rivers, in the district called the Hillabees, *viz.* Hillabees, Killeegko, Oakchoys, Slakagulgas, and Wacacoys. On the waters of the Tallapoosie, from the head of the river downward, are the following: *viz.* Tackabotchee, Tehassa, Totacaga, New-York, Chalaacpaulley, Loguspogus, Oakfuskee, Ufala Little, Ufala Big, Sogahatches, Tuckabatchees, Big Tallafsee, or half-way-house, Clewaleys, Coofahatchies, Coolamus, Shawansee or Savannas, Kenhalka, and Muckelefes. The towns of the Lower Creeks, beginning on the two waters of the Chattahoochee, and so downwards, are Chelu Nanny, Chattahoosee, Holitotoga, Cowetas, Cuffitahs, Chalagatcoor, Broken Arrow, Euchees Several, Hitchatees Several, Palachuolo, and Chewackala: besides 20 towns and villages of the little and big Chehaws, low down on Flint and Chattahoosee rivers: their country is hilly, but not mountainous, and the soil is very fertile and well watered, their agriculture is as far advanced as it well can be, without the proper implements of husbandry. They cultivate tobacco, rice, Indian corn, potatoes, beans, peas, cabbage, melons, and have plenty of peaches, plums, grapes, strawberries, and other fruits. A very large majority of the natives being devoted to hunting in the winter, and to war or idleness in the summer, they cultivate but small parcels of ground, barely sufficient for subsistence. But many individuals, particularly on Flint river, among the Chehaws, who possess a number of negroes, have fenced fields, tolerably well cultivated: but as they have no ploughs, they break the ground with hoes, and scatter the seed promiscuously over the ground, in hills, but not in rows: they rear horses, cattle, fowls, and hogs: the only articles they manufacture are earthen pots and pans, baskets, horse-ropes, or halters, smoked leather, black marble pipes, wooden spoons, and oil from acorus, hickory nuts, and chefnuts. Their land is a common stock, and any individual may remove from one part of it to another, and occupy vacant ground wherever he can find it. From their unsettled and roving disposition, their number cannot be easily or exactly ascertained. The fighting men are estimated at between 5 and 6000, exclusive of the Seminoles, who are of little account in war, except as small parties of marauders. The whole number of persons that compose the Creek nations may be reckoned at about 25 or 26,000.

Every town and village has one established white trader in it, and generally a family of whites, who have fled from some part of the frontier. The Creeks are a well-made, expert, hardy, sagacious, politic people, jealous of their rights, and averse from parting with their lands. They are badly armed, having few rifles, and being mostly armed with muskets. For about 40 years past, they have had little intercourse with any foreigners, except the English, to whom they are much attached, and whom they highly respect. Their language is soft and musical, and is spoken through the whole confederacy, though composed of many nations, who have a speech peculiar to themselves, and also by their friends and allies, the Natchez, the Chickasaw and Chactaw language is, say the Muskogulges, a dialect of theirs. These people are singularly laudable for prohibiting the use of spirituous liquors. One of the principal articles in their treaties with the white people is, that no kind of spirituous liquors shall be sold or brought into their towns. Most of their favourite songs and dances they derive from their enemies, the Chactaws, who are famous for poetry and music. Their music is both vocal and instrumental; but of the latter they have scarcely any thing that deserves the name; such are the tambour, rattle-gourd, and a kind of flute, made of a joint of reed, or the tibia of the deer's leg, which yields a hideous melancholy discord, rather than harmony; but the tambour and rattle, accompanied with their sweet low voices, produce a pathetic harmony, in which they keep time together; the countenance of the musician expressing, at proper intervals, the solemn elevated state of his mind; and the harmony touches the feelings of the attentive audience, and produces an universal sensation of delight and tranquillity throughout the assembly. Their music, both vocal and instrumental, united, keeps exact time with the performers or dancers. In dancing, their most admired and generally practised step is slow, shuffling, and alternate; both feet moving forward one after the other, first the right foot foremost, and next the left, moving one after the other, in opposite circles, *i. e.* first a circle of young men, and within a circle of young women, moving together opposite ways, the men with the course of the sun, and the females in a contrary direction; the men strike their arms with the open hand, and the girls clap hands, and raise their shrill sweet voices, answering an elevated shout of the men at stated times of termination of the stanzas; and the girls perform an interlude or chorus separately. In accompaniment with their dances, they have songs, martial, bacchanalian, and amorous,—and they have also moral songs, which seem to be the most esteemed and practised, and answering the purpose of religious lectures. Their doleful moral songs or elegies have a quick and sensible effect on their passions, and they manifest a lively affection and sensibility in their countenances. They have also a variety of games for exercise and pastime, some peculiar to the men, others to the female sex, and others in which both sexes are employed. The ball-play is esteemed the most noble and manly exercise. This game is exhibited in an extensive level plain usually contiguous to the town; and in this the inhabitants of one town play against those of another, in consequence of a challenge, where the youth of both sexes are often engaged, and sometimes stake their whole substance. Here they perform amazing feats of strength and agility. The game principally consists in taking and carrying off the ball from the opposite party, after being hurled in the air, between two high pillars, which are the goals, and the party which bear off the ball to their pillar win the game. Each person has a racket or hurl, which is an implement of curious construction, resembling a ladle or small hoop net, with a handle about three feet in length, the

hoop and handle of wood, and the netting of thongs of raw hide, or tendons of an animal. The foot-ball is likewise a favourite diversion. All their games are terminated with feasting and dancing in the public square. They have, besides, festivals almost for every month in the year, which are chiefly dedicated to hunting and agriculture. The principal of these is the bust, or feast of first-fruits, which seems to end the last, and begin the new year. There are three in August, when their new crops of corn are arrived at maturity, and every town celebrates it separately, when their new harvest is ready. If they have any religious rite or ceremony, this festival is its most solemn celebration. They begin with cleansing their houses, squares, and the whole town, of their filth, and consuming all their old vestments and provisions with fire. Then follows a fast of three days, during which the fire in the whole town is extinguished, and they abstain from the gratification of every appetite and passion. A general amnesty is proclaimed, and malefactors may return to their town, and they are absolved from their crimes, which are now forgotten, and they are restored to favour. On the fourth morning, the high priest, by rubbing dry wood together, produces new fire in the public square, whence every habitation in the town is supplied with the new and pure flame. The women then go forth into the harvest-field, and bring from thence new corn and fruits, which, being duly prepared, are solemnly brought, together with drink, into the square, where the people are assembled, in their new cloaths and decorations. The women and children place themselves in their separate families, and in the evening repair to the public square, where they dance, sing, and rejoice through the whole night, observing a proper and exemplary decorum: this continues three days, and during the four following days they receive visits, and rejoice with their friends from neighbouring towns, who have purified and prepared themselves. The Muskogulges allow of polygamy in the utmost latitude: for every man takes as many wives as he pleases; but the first is queen, and the others her handmaids and associates.

The youth of both sexes are fond of decorating themselves with external ornaments. The men shave the head, leaving a crest or comb, beginning at the crown, where it is frized and stands upright, covering the hinder part of the head and neck, and terminating behind in lank hair, ornamented with pendant silver quills, and jointed silver plates. Their ears are lacerated, and a piece of lead is fastened to the cartilage, which extends it to a great length, and which is then bound round with brass or silver wire in the form of a bow or crescent, decorated with soft white plumes of heron feathers. Their temples are encircled with a curious diadem or band, ingeniously wrought or woven, and decorated with stones, beads, porcupine quills, &c.; the front peak of it being embellished with a high waving plume of crane or heron feathers. Their clothing is simple and frugal. The head, neck, and breast are painted with vermilion; and some of the warriors have the skin of the breast, or muscular parts of the body, inscribed with hieroglyphic scrolls, flowers, figures or animals, stars, crescents, and the sun in the middle of the breast; which stains are given in youth, by pricking the skin with a needle, and rubbing in a blueish tinct. The decorations of dress are restricted to particular occasions; for the male youth are perfectly naked till they attain the age of twelve or fifteen years: but the females always wear a jacket, sash, and buskin, which reach to the middle of the leg. The junior priests or students constantly wear the mantle or robe, which is white; that of others being of a scarlet or blue colour; and they have a great owl skin

cased and stuffed, and so well executed as almost to represent the living bird, having large sparkling glass beads or buttons fixed in the head for eyes:—this ensign of wisdom and divination they sometimes wear as a crest on the top of the head: at other times it is borne on the arm, or on the hand. These bachelors are always distinguishable from other people by their taciturnity, grave and solemn countenance, dignified step, and by their singing to themselves songs or hymns, in a low sweet voice, as they stroll about the towns. For a farther account of the manners and customs of these people, see Bartram's Travels through North and South Carolina, Georgia, &c.

CREEKS' *Crossing-place*, lies on Tennessee river, about 40 miles E.S.E. of the mouth of Elk river, at the Muscle shoals, and 36 S.W. of Nickajack, in the Georgia Western territory.

CREEL, in *Rural Economy*, a name often provincially applied to signify a sort of stool contrived in different forms, for the purpose of performing different operations on sheep, and other small animals: such as smearing, clipping, slaughtering, &c. It is in much use in some districts, while in others it is almost wholly unknown.

CREENGLES, *Cringles*, probably derived from *krinckelen* (Beig.), to run into twigs, in *Naval Architecture*, are small ropes spliced into the bolt-ropes of the sails of the main-mast and fore-mast, into which the bowling bridles are made fast; and are also to hold by when a bonnet is shaken off.

CREEPER, in *Ornithology*, the English name of the *CERTHIA*; which see.

CREEPER, *New Zealand*. See *MEROPS Nova Islandia*.

CREEPER, *yellow throated*, and black and white *creeper*. See *MOTACILLA flavicollis* and *varia*.

CREEPER, in *Sea Language*, a sort of grapnel, having a shank, and four hooks or claws, but without flooks; used for recovering things that may be cast overboard.

CREEPING, *REPENS*. in *Botany*, is applied either to a root or stem, when either of them is extended horizontally, and throws out fibres for the absorption of nourishment as it goes. See *ROOT* and *RADICLE*. A creeping root, *radix repens*, is a kind of subterraneous stem, the fibres, which it sends forth here and there, being the only efficient part of the root. It serves powerfully for the increase of such plants as are furnished with it, whose vital principle is often so entirely devoted to the root, as not to have sufficient energy left to perfect the seeds. The Mints, the *Triticum repens*, or Couch-grass, and various others of the last-mentioned tribe, destined to inhabit and to bind down the sandy shores of the ocean, all exemplify this kind of root. In some other plants, particularly such as grow parasitically on the stems or branches of trees, the upper side of the root is frequently bare, witness the genus *Epidendrum*; and the same may be observed of some species of *Iris*.

A creeping stem, *caulis repens*, (see *CAULIS*), runs either along the ground, or over rocks, walls, or the trunks of trees; in every case throwing out radicles for the absorption of nourishment, as, in many species of Cinquefoil or *Potentilla*, several brambles, and other plants. When the fibres of the stem serve merely to attach it to other bodies for support, as in the ivy, such a stem is called *radicans*, clinging, a term by many botanists not sufficiently distinguished from the above. S.

CREGER'S TOWNS, in *Geography*, a town of America, in the state of Maryland, and Frederick county, on the W. side of Menococy river, between Owing's and Hunting creeks, which fall into that river; 9 miles S. of Emmitsburg,

burg, near the Pennsylvania line, and about 11 N. of Fredericktown.

CREGLINGEN, a small town of Franconia, on the Tauber, which formerly belonged to the king of Prussia, as margrave of Anspach.

CREICHAU, a canton of Germany, in Suabia, which formerly belonged to the free nobility of the German empire, and as such consisted of several lordships, under the immediate counts and barons of the empire. It is now part of the kingdom of Wurtemberg.

CREIL, in Latin *Creolium*, a small town of France, in the department of the Oise, on the river Oise, 6 miles N.W. of Senlis, and 36 miles N. of Paris. It is the chief place of a cañon in the district of Senlis. It has 1000, and the canton 12,402 inhabitants, living in 19 different communes, upon a territorial extent of 245 kilometres.

CREILSHEIM, a small town of Franconia, on the river Saxe, with an ancient citadel, and a grammar-school. It formerly belonged to the king of Prussia, as margrave of Anspach.

CREIOPOLUS, in *Ancient Geography*, a mountain of the Peloponnesus, in the Argolide, situated on the route from Tegæa to Argos, according to Strabo.

CRELLIUS, JOHN, in *Biography*, was born in Franconia, in the year 1590. He was indebted to his father for the early part of his school-learning, and afterwards pursued his studies at Nuremberg. At this place he was distinguished for great application, and excellent talents, and obtained the respect and favour of his superiors. He studied successively at some other German academies, and became an excellent linguist, and deeply versed in the Aristotelian philosophy. He next began to read with attention the works of the most celebrated divines, intending to make theology his principal pursuit. As, however, he meant to form his own opinions independently of the authority of great names, he previously formed the liberal determination of embracing no speculative doctrines concerning the truth of which he should not be perfectly satisfied from his own enquiries. He soon found reason to be dissatisfied with the Lutheran system, in which he had been brought up, and disavowed his belief in it. By this profession of his faith, or as his contemporaries would rate it, of his want of faith, he was prevented from rising to that eminence to which he would have otherwise attained: he resigned his pretensions to the office of inspector of youth, to which he was nominated in the year 1610. This was a great cause of mortification to his friends, who had anticipated for him the highest preferments in the church. Crellius, however, determined, according to the maxim of his great Master, to make every thing, even the attachment of friends, and the nearest relations, subservient to his sense of duty; he accordingly left his native country, and removed to Poland, where he had not a single friend; but the spirit of enquiry was cultivated and encouraged there, with singular advantages. At Racow, whither he arrived in 1612, he met with a considerable degree of patronage, joined the Unitarian church of that place, and determined to devote himself and his talents to the profession of the ministry. In the following year he was appointed Greek professor of the university; and in 1615 commenced the office of a public preacher with great acceptability. In the following session he was nominated rector of the university, a post which he filled with much usefulness, and honour, for the space of five years, when he resumed his ministerial functions, and was fixed on as one of the stated pastors of the church at Racow. The duties of this office he performed with great assiduity: he zealously defended and illustrated the opinions which he had em-

braced, as well from the pulpit, as from the press. He appeared as an advocate for Socinus against the celebrated Grotius, on the subject of the atonement. Crellius's answer was well received by his learned antagonist, who was from this, and other circumstances, suspected to lean, according to Moreri, too much to the Unitarian doctrines. Besides this answer to Grotius, the principal works of our author were, two books concerning the one God the Father, generally spoken of in catalogues as "*Crellius de Deo*;" "*A Treatise concerning God and his Attributes*;" one on "*The Holy Spirit*;" and another containing "*A Defence of Religious Liberty*." He wrote on "*Ethics*," and on various topics, which he discussed with learning, and great candour. He is reckoned one of the ablest among the *Fratres Poloni*, and his works make almost the half of the four volumes so well known in every theological library. He was intent upon planning other works, when he was attacked by a fever, which carried him off in the forty-second year of his age; highly revered for his integrity, learning, and ardent piety. Moreri. *Life of Socinus*.

CREMA, in *Geography*, a town of Italy, and capital of the Cremasco, situated on the river Serio, well built, fortified, populous, commercial, and rich: the see of a bishop, suffragan of Bologna. It contains 5 parish churches, and 16 convents. The name is said to be derived from *κρημα*, to burn, as being built on the ruins of a more ancient and beautiful town, burned by order of the archbishop of Milan, in the year 951; it has belonged to the Venetians from the year 1428: 22 miles E.S.E. of Milan. N. lat. 45° 22'. E. long. 6° 26'.

CREMASCO, a country of Italy, taking its name from the capital Crema, situated in the Milanese, and belonging to the Venetians. It is small, but fertile in corn, wine, flax, and hemp.

CREME, in *Ancient Geography*, a town of Asia, in the Pontus. Steph. Byz.

CREMAILLE, or **CREMAILLE'RE**. When the inside of the parapet of any work is notched or broken in such a manner as to resemble the teeth of a saw, it is said to be *en cremaille*, or *en cremailere*, whether it be in any part of a regular fortification, or in a field redoubt, in a line of circumvallation or countervallation, &c. This formation of the inside of a work by indenting it with small redans, having each of them one face perpendicular to the capital of the work, and the other parallel to it, is very useful for taking off the defects of salient angles, and furnishing defences in different directions from the same part. To whom this useful contrivance is justly attributable is not certainly known. Mr. Clairac says, that Mr. de la Fon, director of fortification of the maritime places in Flanders, shewed him at Duunkirk, in 1740, a project of this kind in tracing out a covert-way, and that Mr. De Verville, formerly chief engineer at Rocroi, to whom he had mentioned it, shewed him, in 1741, the plan of a redoubt at the army on the Lower Rhine, wherein he had proposed to defend the angles in this manner.

CREMASTA, in *Ancient Geography*, a place of Asia, situated, according to Xenophon, near the town of Antandra.

CREMASTER, in *Anatomy*, from *κρημα*, to suspend, is a muscle belonging to the testis. It arises from the inferior border of the internal oblique, and transversalis muscles; chiefly from the former. It becomes connected to the outer side of the spermatic chord, and passes, with that part, through the ring of the external oblique. Its fibres are in some degree separated as it descends, and they are ultimately scattered over the upper part of the tunica vaginalis testis. The fibres of this muscle pursue quite an opposite course in

the embryo; being reflected towards the abdomen. These muscles serve, as their name imports, to suspend the testes in their situation; and to bear the weight of these parts. They will draw the testes towards the abdominal ring; which effect may be observed in coughing; and particularly in the hooping cough. It is said to elevate the testis, and to produce some compression, or concussion of the part in the act of coition.

CREMATION is sometimes used for burning, particularly when applied to the ancient custom of burning the dead. This custom is well known to have prevailed among most eastern nations, and continued with their descendants after they had peopled the different parts of Europe. Hence we find it prevailing in Greece, Italy, Gaul, Britain, Germany, Sweden, Norway, and Denmark, till Christianity abolished it. Phil. Trans. N^o 458. sect. 3.

CREMAUX, in *Geography*, a small town of France, in the department of the Loire in the district, and 6 miles south of Rouanne.

CREMBS, a river of Carinthia, which runs into the Lyzer, about 6 miles N. of Milltatt.

CREMBSPERG, a town of Carinthia; 7 miles N. of Milltatt.

CREMERA, in *Ancient Geography*, a small river of Italy, in Etruria; it issues out of the lake of Baccano, and after a course of 3 miles, runs into the Tiber. It is at present called "La Varea," and is famous in ancient history for the surprize and slaughter of the Fabii by the Veientes. According to Livy, (l. ii. c. 50.) and other Roman historians, 306 of the Fabii fell into an ambuscade, and were cut to pieces near this river; one alone of the whole family surviving, who, by reason of his tender years, had been left at Rome. He, it is said, was the grandfather of Fabius Maximus, of whom Ennius says,

"Unus qui nobis cunctando restituit rem."

Virgil *Æn.* vi. 846.

"Whose wife delays retriev'd the Roman state."

CREMIEU, in Latin *Cremaicum*, in *Geography*, a small town of France, in the department of Isere, 18 miles E. of Lyons, at no very great distance from the Rhone. It is the chief place of a canton, in the district of La Tour du Pin, with a population of 2123 individuals. The canton itself has 29 communes, 13,823 inhabitants, and a territorial extent of 320 kilometres. Near Cremieu is the famous grotto of Notre Dame de la Balme.

CREMMEN, an ancient but small town of Prussia, in the middle mark of Brandenburg, containing about 300 houses, and remarkable for two battles which were fought in its vicinity, between the sovereigns of Brandenburg and Pomerania; one lost by the Margrave, Lewis of Brandenburg, against the duke of Pomerania in 1331, and the other won against another duke of Pomerania by the elector Frederic I. in 1413.

CREMNA, in *Ancient Geography*, a town of Asia, in Pisidia, according to Strabo and Ptolemy.—Also, an episcopal town of Asia, in Pamphylia Secunda.

CREMNI, a town of European Sarmatia, near the Patus Mæotis and Tanais, according to Herodotus, who says it was a commercial town. Ptolemy.

CREMNI SCOS, a town of European Sarmatia, placed by Ptolemy on the other side of the Ister.

CREMNITZ, KREMNITZA, Kermotz, in *Geography*, the principal mine-town of Hungary, about 40 miles to the south of the Carpathian mountains, in a deep valley famous for the nine rich gold and silver mines, which are in its neighbour-

hood. It has a mint which used to coin one hundred thousand ducats annually; but, at present, the mines yield the precious metals less abundantly.

Cremitz itself is an inconsiderable place; but the suburbs are large. It has three churches, an infirmary and a Franciscan convent. On a hill near the town is an old castle with a church.

In 1731, Cremitz was honoured with the visit of the emperor Francis I., who, in the garb of a miner, went down a very deep shaft.

Both the mines and the town of Cremitz suffered considerably during the disturbances raised by prince Rakotzy and count Tekely.

CREMONA, a town anciently of Gallia Transpadana, and now capital of the Cremonese, situated in a delightful plain, watered by the Oglio, about a quarter of a mile from the Po, over which is a bridge of boats, protected by a fort, as the town is by a castle: a canal, which passes through the town, forms a communication between the Oglio and the Po:—its circumference is about 5 miles. The principal streets are wide and straight, adorned with some small squares, and a few palaces, but the houses in general are not well built. An university was founded in this city by the emperor Sigismund; but it has long been in a declining condition. Cremona has 40 parish churches, from the tower of one of which is an extensive view over the fertile plains of Austrian Lombardy, 43 convents, and about 12,000 inhabitants. This is the see of a bishop, suffragan of Milan. This town is said to have been built 391 years B. C. When the country became subject to the Romans, they sent a colony into this city in the year of Rome 535, and a second in 562. In the war of Antony and Augustus, it took part against the latter; who surrendered the town and the adjacent territory to the plunder of the soldiers. After having recovered its former flourishing state, it was burnt by the soldiers of Vespasian. It was again laid waste by the Goths A. D. 630. In 1796, it surrendered to the French without resistance.

CREMONA STOP, on an organ, is a single reed stop, originally designed to imitate an ancient wind instrument, called a *Kneimborn*, (which see;) but time and the ignorance of organ-builders have corrupted this word into Cremona, which has led some of late to suppose, that this stop was at first intended as an imitation of the violin. See ORGAN.

CREMONAGE, in *Geography*, a country of Italy in the Milanese, deriving its name from its capital, Cremona; bounded on the E. by the duchy of Mantua, on the N. by the Bressan, on the W. by the Lodofan and Cremasco, and on the S. by the Parmesan, from which it is separated by the Po. It belonged for a long time to Spain till the famous war for the succession of Charles II., when it was ceded to the house of Austria, and made a fief of the empire. It is a fertile country, particularly in wine and fruit.

CREMONINI, GIO. BATISTA, in *Biography*, a painter, was a native of Cento, and flourished at Bologna in the 16th century. He had sufficient knowledge of perspective and architectural decorations, and was much employed at Bologna in painting in fresco the façades of the palaces and houses of persons of distinction, which he ornamented with the imitations of statues, basso-relievs, and friezes, representing combats of wild beasts, &c., which he executed with great spirit. He had the honour of numbering Guercino amongst his disciples. Cremonini died in 1610. Lanzi. Orlandi.

CREMPE, or KREMPE, in *Geography*, a town of Germany,

many, in the duchy of Holftein, feated on a brook or small river, which foon after runs into the Stoer: the inhabitants deal chiefly in cattle; 4 miles N. of Guuckftadt, and 27 N.W. of Hamburg.

CREMS, or KREMS, a town of Germany, in the arch-duchy of Austria, on the Danube: 32 miles W. N.W. of Vienna.—Also, a river of Austria, which runs into the Danube near Crems.

CREMSIER, KREMSIER, or *Kromerziz*, a small town of Moravia, in the circle of Prerau, on the river March, 24 miles S. of Olmutz, and the ufual refidence of the bifhops of Olmutz. It is well built, and has feveral churches and convents.

CREMSMUNSTER, or KREMSMUNSTER, a small town of Upper Austria, or the country above the Ens, 30 miles S. E. of Lintz on the river Krems, which, in the year 1490, obtained the rank of a market town, on account of the adjacent rich abbey of Benedictines, founded in the year 777. It has an academy for young noblemen.

CRENAN CRAIG, a cape of Scotland, on the coast of the county of Wigtown, in Luce bay: 13 miles S.S.E. of Stanraer.

CRENATUM, FOLIUM, in *Botany*, a notched or crenate leaf, has its margin cut into a number of notches, which are not directed towards either of its extremities; as in *Glechoma hederacea*, the Ground Ivy, and efppecially *Chrysofolium*, or Golden Saxifrage. The notches may be more or lefs acute, and in fome leaves they confift of a double ferief, for which the term *duplicato crenatum* is ufed. When the notches are very minute, the diminutive is adopted, *crenulatum*. All thefe terms are alfo occasionally applied to the *corolla*, *nectarium*, or any other expanded part of a vegetable. See SERRATUM. S.

CRENÆA, Schreb. gen. 807. Lam. Enc. Wild. 932. Juff. 332. Aubl. 523. Clafs and order, *dodecandria monogynia*. Nat. Ord. *Salicarie*, Juff.

Gen. Ch. *Cal.* Perianth one-leaved, top-shaped, permanent, four-cleft half way down; fegments egg-shaped, acute, equal, fpreading. *Cor.* Petals four, roundifh, longer than the calyx, and attached to it between its divifions. *Stam.* Filaments fourteen, capillary, white, inferted into the calyx below the petals, inclined to one fide; anthers roundifh. *Pift.* Germ fuperior, globular; ftyle long, incurved; ftigma oblong, thickifh. *Povic.* Capsule globular, five-celled, its lower part furrounded by the calyx. *Seeds* numerous, very fmall.

Eff. Ch. Calyx four-cleft, bearing the corolla. Petals four. Capsule five-celled, with many feeds.

Sp. C. *maritima* Aubl. tab. 209. *Stems* feveral, two or three feet high, knotty, quadrangular, winged. *Leaves* oppofite, oval-oblong, obtufe, narrowed near the bafe, almoft feffile, even-furfaced, entire, green. *Flowers* white, axillary; peduncles often two together, fflender, fhorter than the leaves, divided into two very fmall, one-flowered pedicels; bracts one at the bafe of each peduncle; two about the middle, oppofite. A native of Cayenne, growing in the falt water.

CRENDIREK, in *Geography*, a lake of America, in North Carolina; 30 miles N. N. E. of Newbern.

CRENEAUX, Fr. *Loop-holes*, are fmall openings made in the walls of a work for receiving the ends of mufkets or fmall fire-arms, and for firing through on thofe who advance to attack it. A creneau, or loop-hole, is for a mufket what an embrafure is for a cannon. It is alfo called *meurtriere*. Its opening on the outside is about three inches broad, and from 12 to 15 inches in height or depth, and on the infide it is from 8 to 10 inches wide.

VOL. X.

CRENELLE, in *Heraldry*. See EMBATTLED.

CRENI, in *Ancient Geography*, a place of Asia Minor, in Phrygia.

CRENIDES, a maritime place of Asia Minor, in Bithynia, fituated, according to Arrian, on the coast of the Euxine fea, between the port of Sandaraca and the town of Pfylla.

CRENO. *the Lake of*, in *Geography*, is a lake of confiderable extent at the top of mount Rotondo, in Corfica, in the department of Golo, out of which iffues the river Tovignano.

CRENOPHYLAX. The *crenophylaces* at Athens were magiftrates who had the infpection and management of fountains under their care.

CREODIBA, in the *Customs of the Middle Age*, a robbery and murder committed in a wood, where the body of the perfon killed was burnt, in order to prevent any difcovery of the crime. The word, fays Wendelinus, is compounded of *cray* and *diven*, that is, *wood-robbers*.

CREOLES, a name given to the families defcended from the Spaniards who firft fettled at Mexico in America. Thefe confitute the fecond clafs of fubjects in the Spanifh colonies; and they are diftinguifhed from the CHAPETONES, who are the firft in rank and power; from the mixed race, forming the third clafs of citizens, and comprehending the MULATTOS and MESTIZOS; from the NEGROES, who hold the fourth rank; and from the *Indians*, who form the laft and the moft depressed order of men in the country, which belonged to their anceftors. The character and ftate of the Creoles have enabled the Chapetones, or Spaniards arrived from Europe, to acquire various advantages, befides thofe which they derive from the partial favour of government. Although fome of the Creolian race are defcended from the conquerors of the New World; though others can trace up their pedigree to the nobleft families in Spain; though many are poffeffed of ample fortunes; yet, by the enervating influence of a fultry climate, by the rigour of a jealous government, and by their defpair of attaining that diftinction to which mankind naturally afpire, the vigour of their minds is fo entirely broken, that a great part of them wafte their life in luxurious indulgences, mingled with an illiberal fuperftition ftill more debafing. Languid and unenterprifing, the operations of an active extended commerce would be to them fo cumbersome and oppreffive, that almoft in every part of America they decline engaging in it. The interior traffic of every colony, as well as its trade with the neighbouring provinces, and with Spain itfelf, are carried on chiefly by the Chapetones; who, as the recompence of their induftry, amafs immenfe wealth; while the Creoles, funk in floth, are fatisfied with the revenues of their paternal eftates. From this ftated competition for power and wealth between thefe two orders of citizens, and the various paffions excited by a rivalfhip fo intereffing, their hatred is violent and implacable. The court of Spain, from a refinement of diftruftful policy, cherifhes thefe feeds of difcord, and foments this mutual jealousy, which not only prevents the two moft powerful claffes of its fubjects in the New World from combining againft the parent ftate, but prompts each, with the moft vigilant zeal, to obferve the motions, and to counteract the fchemes of the other. To the Creoles, or natives in the Weft Indies, fays Mr. B. Edwards, we muft look for the original and peculiar caft of character impreffed by the climate, if indeed the influence of climate be fuch as many writers imagine. (See CLIMATE.) This writer conceives that the climate of the Weft Indies difplays itfelf more ftroingly on the perfons of the natives, than on their manners, or on the faculties of their

their minds. They are obviously, he says, a taller race, on the whole, than the Europeans, but, in general, not proportionably robust. Many of them are six feet four inches in height; but they want bulk, corresponding to our ideas of masculine beauty. All of them, however, are distinguished by the suppleness of their joints, which enable them to move with great ease and agility, as well as gracefulness, in dancing. They also excel in penmanship, and the use of the small sword. It has been truly observed, he says, that the effect of climate is likewise obvious in the structure of the eye, the socket being considerably deeper than among the natives of Europe. By this conformation, they are guarded from the injurious effects of an almost continual strong glare of sun-shine; he also remarks, that their skin feels much colder than that of an European, a circumstance which, as he conceives, proves, that nature has contrived some peculiar means of protecting them from the heat, which she has denied to the nations of temperate regions, as unnecessary. Accordingly, though their mode of living differ in no respect from that of the European residents, they are rarely obnoxious to those inflammatory disorders, which frequently prove fatal to the latter. The Creole women, by their singularly abstemious diet, and the calm tenour of their lives, are peculiarly exempt from these disorders. Hence, however, their fibres are relaxed and their countenances wan. The Creole ladies, though destitute of that bloom which is more discernible in colder countries, surpass most others in their large, languishing, and expressive eyes; sometimes beaming with animation, and sometimes melting with tenderness; a sure index, says the writer now cited, to that native goodness of heart and gentleness of disposition for which they are eminently and deservedly applauded, and to which it is owing that no women on earth make better wives, or better mothers. The Creole ladies are also noted for very fine teeth, which they preserve beautifully white by a constant use of the juice of a withe called the "Chewstick," a species of rhamnus. This is cut into small pieces, and used as a tooth-brush. The juice is a strong bitter, and a powerful detergent. The circumstance most observable in the character of the West Indian Creoles is an early display of the mental powers. Hence it has been said that as the genius of the young West Indians attains sooner to maturity, it declines more rapidly than that of Europeans. The chief cause, however, according to De Ulloa, of the short duration of such promising beginnings seems to be the want of proper objects for exercising the faculties. The propensity also, which the climate undoubtedly encourages, to early and habitual licentiousness, induces a turn of mind unfriendly to mental improvement. Among such of the natives as have happily escaped the contagion and enervating effects of youthful excesses, men are found of capacities as strong and permanent as among any people whatever. Mr. Edwards cannot either admit that the Creoles in general possess less capacity and stability of mind than the natives of Europe, or allow that they fall short of them in those qualities of the heart which render man a blessing to all around him. Generosity to each other, and a high degree of compassion and kindness towards their inferiors and dependents, distinguish the Creoles in a very honourable manner. To this purpose, Mr. Ramsay observes, in his "Essay on the Treatment and Conversion of the Slaves," &c. that adventurers from Europe are universally more cruel and morose towards the slaves than the Creoles or native West Indians. "If they are proud," says Mr. Edwards, "their pride is allied to no meanness. Instructed from their infancy to entertain a very high opinion of their own consequence, they are cautious of doing any act which

may lessen the consciousness of their proper dignity. From the same cause they scorn every species of concealment. They have a frankness of disposition beyond any people on earth. Their confidence is unlimited and entire. Superior to falsehood themselves, they suspect it not in others." Indolence, this writer allows, is too predominant among them; but timidity constitutes no part of their character; and even the indolence, of which they are accused, is rather an aversion from serious and deep reflection than a sluggishness of nature. Both sexes, when the springs of the mind are set in motion, are remarkable for a warm imagination, and a high flow of spirits. Robertson's America, vol. iii. Edwards's West Indies, vol. ii. Voy. de Ulloa; and Voy. de Frezier.

CREON, in *Ancient Geography*, a mountain of the island of Lesbos.

CRE'ON, in *Geography*, a small town of France, in the department of the Gironde, chief place of a canton in the district of Bourdeaux. It has only 843, but the canton contains 13,394 inhabitants, dispersed in 28 communes, upon a territorial extent of 192 kilometres and a half.

CREONES, in *Ancient Geography*, a people who, according to Ptolemy, inhabited the northern part of Britain, on the western coast, N. of the Cerones.

CREONIUM, an ancient town of Macedonia, near the Lychnide lake. Polybius.

CREOPHAGI, a people of Ethiopia, near Egypt, placed by Strabo above the port of Antiphile. Both men and women practised a kind of circumcision.

CREOPHYLUS, in *Biography*, an excellent poet of Samos, contemporary with Homer, who presented him, as Strabo informs us, with a poem on the taking of the city Oechalia. This poem is also mentioned by Pausanias and Callimachus; but both these writers ascribe it to Creophylus, and not to Homer. Creophylus entertained Homer at his house, and is said by some to have been his master, and to have had great share in composing the divine work, as Cicero styles it, which passes under the name of that inimitable poet.

CREPANU, in the *Manege*, a chop in a horse's leg, made by the spunges of the shoes of one of the hinder feet, crossing and striking against the other.

CREPIDÆ, among the Romans, a kind of slippers or shoes, which were always worn with the *pallium*, as the *calcei* were with the *toga*.

CREPIS, in *Botany*, (the name of a plant in Pliny.) Linn. Gen. 914. Schreb. 1230. Willd. 1412. Gart. 915. Juss. 169. Vent. 2. 485. Class and order, *Syngensia polygamia aequalis*. Nat. Ord. *Compositæ semiseseuleæ*, Linn. *Cichoraceæ*, Juss.

Gen. Ch. Calyx common double; exterior one generally very short; scales generally spreading, deciduous; interior one egg-shaped, simple, furrowed, permanent, often swelling in the middle as the seeds ripen; scales linear. Cor. uniform; florets in several ranks, all ligulate, hermaphrodite, five-toothed. Stam. Filaments five, capillary, very short; anthers united in a hollow cylinder. Pist. Germ somewhat egg-shaped; style filiform, the length of the stamens; stigmas two, reflexed. Peric. none, except the permanent inner calyx. Seed solitary, oblong, spindle-shaped or columnar; down simple or feathery, sessile or stipitate. Recept. roughish.

Ess. Ch. Calyx calyced with deciduous scales. Florets in several ranks. Receptacle roughish.

Sp. 1. *C. burffolia*. Linn. Sp. Pl. 2. Mart. 2. Lam. 1. Willd. 1. (Hæracium ficulum, burse pastoris folio; Boec. Mas. 2. 147. tab. 106. and 112. Tourn. 471.) "Leaves pinnatifid,

pinnatifid, crenated; scape few-flowered." *Root* perennial. *Stems* six or seven inches high, naked, or furnished only with a few short lacinated leaves. *Root-leaves* spread on the ground, resembling those of *Thlaspi bursa pastoris*, or common shepherd's purse. *Flowers* rather small, on slender peduncles. A native of Italy and Sicily. 2. *C. nemausensis*. Willd. 2. Gouan. Illuf. 60. Allion. Ped. 309. tab. 75. fig. 1. (*Andryala nemausensis*; Vill. Delph. 3. 66. tab. 26.) "Leaves runcinate-lyrate, obtuse, toothed; scape many flowered, hispid; calyx-scales membranous at the edge." *Root* annual. Whole plant hispid. It has some resemblance to *hieracium sanctum* of Linnæus; but we have the authority of Dr. Smith for asserting, that Willdenow is wrong in supposing it to be the same plant. A native of the south of France, Italy, and Palestine. 3. *C. leontodontoides*. Willd. 3. Allion. Anc. Ad. Fl. Pedem. 13. "Leaves runcinate, toothed, smooth; scape many-flowered, ascending; calyxes tomentous; outer scales pressed close to the others." *Root* biennial. *Scape* a foot high, smooth, furnished at the base of the ramifications with a linear-awl-shaped bracte. *Leaves* acuminate, ciliated at the base and on the lower part of the mid-rib. *Doron* capillary, stipitate. A native of Piedmont. 4. *C. taraxacifolia* Willd. 4. Desf. Atl. 2. 231. "Leaves runcinate-pinnatifid, toothed, hispid; stems ascending, leafy at the base, many-flowered; calyxes tomentous; outer scales spreading." *Root* biennial. *Stems* one foot or two feet high, branched. *Peduncles* pubescent; bractes generally two at the base of each peduncle; inner scales of the calyx oblong-lanceolate; outer ones ovate-lanceolate, membranous at the edges. *Doron* capillary, stipitate. A native of Barbary. 5. *C. aparginoides*. Willd. 5. (*Hieracium stipitatum*; Jacq. Auth. 3. tab. 93.) "Leaves lanceolate-obovate, toothed, smooth; stem-ones linear-lanceolate; stem angular, scabrous near the bottom; peduncles and calyxes hispid." *Root* perennial. *Stem* a foot or a foot and half high, furrowed, hispid towards the top, sometimes leafless, two or three-flowered. *Stem-leaves*, when present, from one to three, sessile or somewhat decurrent, nearly entire at the base. *Flowers* yellow; calyx slightly calyced, blackish-green; inner scales lanceolate, smooth, hispid at the base; outer ones few, awl-shaped, hispid; down capillary, stipitate. A native of high meadows in Austria and Bivaria. 6. *C. vesicaria*. Linn. Sp. Pl. 5. Mart. 4. Lam. 3. Willd. 6. β . *Cichorium pratense hirsutum vesicarium*; Buxh. Pin. 126. *Cichorium sylvestricum*; Col. Ephr. 1. 238. tab. 237. "Involucres egg-shaped, concave, obtuse, spreading." Linn. Sp. Pl. "Involucres scarious, the length of the calyx; flowers in corymbs; bractes egg-shaped." Linn. Syst. Nat. *Root* annual, thick. *Stem* a foot and half high, striated, scabrous in its lower part, branched into a panicle, or corymb; longer branches two or three-flowered; the others only one-flowered. *Root-leaves* lyre-shaped, deeply cut at the base, enlarged upwards, entire and obtuse at the summit, runcinate, slightly rough; stem-leaves embracing the stem, acute, furnished with narrow teeth at the base. *Flowers* yellow, terminal; inner or proper calyx oval-conical, very hairy; scales of the outer calyx broad, concave, scarious, having the appearance of an involucre with respect to the other, and at least half its length; bractes at the divarications of the stem, panicle or corymb exactly similar to the scales of the outer calyx. β differs only in having rougher leaves. Dr. Smith, with his usual urbanity and zeal for the promotion of science, has obligingly informed us, that the specimen in the Linnæan Herbarium, from which the description in *Species Plantarum* was formed, was gathered by Hasselquist in the East; and that there appears

no authority for its ever having been found in Switzerland, as Linnæus has stated, from a misapprehension of *C. Bauhinii*'s *hieracium montanum rapifolium*, which Haller refers to *C. bicaris*. There is no specimen of β in the Herbarium, and it seems to have been taken up solely from Columna. Willdenow has considered it as a distinct species, and called it *scariosa*; he has also added another, under the name of *taurincensis*, giving as a synonym, *C. vesicaria*; Balbis; Taur. 93.; but Dr. Smith is inclined to think that he has made three species out of one. According to Willdenow, it differs in having the bractes and outer scales of the calyx, not lanceolate and scarious, but linear-awl-shaped, and only membranous at the edges. Both the varieties are natives of Italy. 7. *C. alpina*. Linn. Sp. Pl. 10. Mart. 5. Lam. 9. Willd. 9. Gært. t. 1. 158. tab. 8. Copied in Latr. Ill. Pl. 651. fig. 1. (*Hieracium alpinum scorzonerae folio*; Tourn. 472. *Leontodon*; Gmel. Siber. 2. 16. tab. 5.) "Leaves embracing the stem, oblong, acuminate; lower ones finely toothed above; upper ones, below." Linn. Sp. Pl. "Involucres scarious, the length of the calyx; flowers solitary." Linn. Syst. Nat. Somewhat resembling the preceding, but distinct. *Root* annual. *Stem* about a foot high, striated, leafy, with two or three simple branches. *Root-leaves* long, spatulate, toothed towards the summit, quite entire and narrowed towards the base; stem-leaves embracing the stem, toothed towards the base. *Flowers* pale-yellow; inner calyx hairy; scales of the outer one loose, smooth, according to Gærtner's figure, not a quarter the length of the other. *Receptacle* concave, deeply pitted; edges of the cavities ciliated. *Seed* very long, rugged, with numerous scabrous striæ, club-shaped at the base, gradually attenuated into a long point; down capillary, much shorter than the seed. Obs. The down of this and some other species may be styled semi-stipitate; it being difficult to determine whether it be seated on a real stipes, or only on the point of the lengthened seed. A native of Italy. 8. *C. albida*. Mart. 17. Lam. 5. Willd. 10. Jacq. Ic. Rar. 1. tab. 164. Allion. Ped. 800. tab. 32. fig. 3. Vill. Delph. 3. 139. tab. 33. "Leaves runcinate-toothed, somewhat hoary; peduncles naked, one-flowered; calyx-scales whitish at the edges." *Root* perennial. *Stems* several, from twelve to fifteen inches high, cylindrical, pubescent, divided into two or three simple branches, with a leaf at each division. *Root-leaves* oblong, runcinate, toothed, enlarged towards the summit, rather thick, clothed with short hairs, whitish; stem-leaves half embracing or sessile, sometimes a little narrowed at their insertion, acute, thinly and slightly toothed. *Flowers* pale-yellow, rather large; peduncles or branches long, one-flowered; outer calyx-scales oval, loose; inner ones lanceolate, pressed close to the flower. A native of the south of France, and of Italy. 9. *C. sinuata*. Lam. 6. "Leaves pinnate-lobed, somewhat scabrous; peduncles naked, one-flowered; outer calyx-scales widely spreading." *Root* perennial. *Stems* a foot high or more, furnished with two or three simple branches, leafy only at the divisions and near the base. *Root-leaves* oblong; stem-ones shorter and more deeply cut. *Flowers* pale-yellow, rather large; peduncles long, beset with some strap-shaped scales, one-flowered; outer calyx-scales green, not scarious. *Seeds* oblong, scabrous; down feathery. A native of the north coast of Africa, observed by Deffontaines, who sent seeds to Paris. 10. *C. rigida*. Willd. 11. Waldf. and Kitaib. Pl. Rar. Hung. 1. 18. tab. 19. "Leaves rigid, scabrous, toothed; root-ones inversely egg-shaped; stem-ones arrow-shaped, embracing the stem; flowers raceme-panicled; calyxes

pubescent." *Root* perennial. *Stem* four feet high, erect, rigid. *Raceme* terminal; long, peduncles two-flowered; outer calyx-scales brown at the tip. A native of the sunny side of mountains in Hungary and Tauria. 11. *C. rigens*. Mart. 18. Willd. 12. Hort. Kew. 3. 127. "Leaves oblong, doubly serrated, bristly; stem naked, branched; flowers panicled; calyxes cylindrical, smooth; down sessile." A native of the Azores, introduced into Kew garden by Masson. 12. *C. rubra*. Linn. Sp. Pl. 6. Mart. 6. Lam. 7. Willd. 13. (*Hieracium dentis leonis folio, flore suave rubente*; Bauh. pin. 127. Tourn. 469. *H. Apulum*; Col. Ecpbr. 1. 242, Moris. § 7, tab. 4 fig. 3. *Chondrilla purpurascens*; Bauh. Prod. tab. 68.) "Root-leaves runcinate-lyrate; stem-ones embracing, lanceolate; lower ones pinnatifid; calyxes hispid; outer scales scarious." Willd. *Root* annual. *Stems* scarcely a foot high, slender, striated, but little branched. *Flowers* of a delicate red colour, terminal, solitary; inner calyx hispid; scales lanceolate-linear; outer one smooth, rather short; scales oval-acute. *Down* semi-stipitate, as in *C. velicaria*. A native of Italy and the south of France. 13. *C. fatida*. Linn. Sp. Pl. 7. Mart. 7. Lam. 8. Willd. Eng. Bot. 405. (*Hieracium amygdalas anaras olens, five odore apuli suaviterubentis*; Tourn. 469. Moris. hist. 3. 63. § 7, tab. 4, fig. 4. *H. castorei* odore; Rai. hist. 232. Syn. 165.) "Leaves runcinate-pinnatifid, rough with hair; petioles toothed; stem hairy; calyx tomentous." *Root* biennial, small. *Stems* several, the central one erect, the others diffuse, branched, leafy, cylindrical, about a foot high. *Leaves* deeply pinnatifid, toothed; the lower stem-ones narrowed at the base into what Linnæus calls a toothed petiole, but which seems properly the termination of a sessile leaf. *Flowers* palish-yellow, terminal; peduncles one-flowered, elongated, thickened upwards, furnished with two or three scales, or small scattered bractæal leaves; calyx clothed more or less with soft hairy down, not glandular; inner scales nearly equal, keeled, finally embracing the marginal seeds; outer ones awl-shaped, loose, short; receptacle ciliate-pitted. *Seeds* slender, yellowish, furrowed, somewhat scabrous; down scabrous, not feathery; on the marginal seeds nearly sessile, on the others distinctly stipitate. The whole plant has the smell of bitter almonds, but stronger, and approaching to that of opium. A native of dry chalky pastures in England and other parts of Europe, but in England at least not of frequent occurrence. 14. *C. sprengeriiana*. Willd. 15. Allion. Ped. n. 810. (*Hieracium sprengeriianum*; Linn. Sp. Pl. Mart. Helminthia; Gart.) "Hispid-scabrous; leaves oblong, embracing the stem, remotely toothed; stem divaricated, branched; outer calyx-scales unequal, spreading." *Root* annual. *Stem* thinly beset with somewhat rigid hairs; branches alternate, short, simple. *Flowers* several, terminal, peduncled. *Down* of the seed stipitate, feathery. A native of Portugal and Italy. 15. *C. aspera*. Linn. Sp. Pl. 4. Mart. 8. Lam. 9. Willd. 16. (*Hieracioides sicula*; Vaill. act. 714.) "Leaves toothed; lower ones egg-shaped, auricled; upper ones arrow-shaped; stem beset with scattered stiff bristles." *Root* annual. *Stem* about a foot high, much branched, panicled, diffuse. *Leaves* rather small, lanceolate, sometimes entire, rough with short hairs. *Flowers* yellow, numerous, on short alternate peduncles; inner calyx oval-cylindrical, hispid, four or five lines long; outer one short, very loose, spreading or reflexed. *Down* of the seed sessile, feathery. 16. *C. rhagadioloides*. Linn. Mant. 16. Mart. 9. Willd. 18. Jacq. Hort. Schænb. 2. 9, tab. 144. "Leaves embracing the stem, oblong; inner calyx egg-shaped, angular, hispid with club-shaped hairs. *Root* annual. *Stem* half a foot high, erect, striated, scabrous, branched. *Leaves* entire

or recurved-toothed, even-sur-faced; lower ones narrowed a considerable way above the base; upper ones arrow-shaped, embracing the stem. *Flowers* yellow, purplish on the under side; peduncles elongated, scabrous, naked, one-flowered; outer scales of the calyx numerous, linear, obtuse, half the length of the others, unequally insert-d; inner ones about thirteen, parallel, boat-shaped, compressed. *Down* of all the seeds capillary. The lappacea of Willdenow seems only a slight variety of the preceding, distinguished by its tumid peduncles, and the simple not club-shaped hairs of its inner calyx. 17. *C. virgata*. Willd. 19. Desfont. act. hist. nat. par. 1. 37. tab. 8. Atl. 2. 230. "Leaves lanceolate, toothed, somewhat pubescent; upper ones linear, nearly entire, sessile; stem rod like; calyxes tomentous." *Root* annual. *Stem* erect, branched, furrowed, smooth. *Leaves* remotely toothed. *Flowers* somewhat umbelled, peduncled; lateral peduncles rising higher than the primary terminal one; calyx tomentous; down of the seed sessile, capillary. A native of Barbary. 18. *C. hieracioides*. Willd. 20. Waldf. and Kitaib. Hung. 1. 71. tab. 70. "Leaves smooth, toothed; root-ones ovate-spatulate, stem ones oblong, sessile; corymb terminal; calyxes glandular-hispid." *Root* perennial. A native of Hungary. 19. *C. hispida*. Willd. 21. Waldf. and Kitaib. Hung. 1. 42. tab. 43. "Bristly-hispid; leaves runcinate, auricled at the base; upper ones lanceolate, sagittate-hastate, pinnatifid at the base; calyxes extremely hispid." *Root* annual. A native of Aultria, Croatia, Slavonia, and the Banat. 20. *C. tectorum*. Smooth hawk's-beard. Smooth succory hawk-weed. Linn. Sp. Pl. 13. Mart. 11. Lam. 10. Willd. 22. Flor. dan. 501. Lam. Ill. Pl. 651. fig. 3. Curt. Lond. fasc. § 5. tab. 25. Eng. Bot. 111. (*Hedynois tectorum*; Huft. *Hieracium Chondrillæ folio, glabrum*; Bauh. Pin. 127. Tourn. 470. *H. luteum glabrum*; Rai. Syn. 165.) "Root-leaves runcinate, lanceolate, or somewhat lyrate, even-sur-faced; the rest embracing the stem, pinnate-toothed, somewhat hastate; stem smooth." A very common and very variable plant in different situations. *Root* annual, tapering. *Stem* often two feet high, erect, branched, furrowed, purplish sometimes, but rarely, a little hairy. *Leaves* smooth, bright green. *Flowers* small, bright yellow; panicle upright, terminal, somewhat corymbid, leafy, roughish; calyx rough. *Seeds* furrowed; down rough, sessile. *Receptacle* somewhat pitted, roughish. A native of England, and many other parts of Europe, on walls, dry banks, &c. flowering from June to the end of September. 21. *C. pinnatifida*. Willd. 26. (*C. virens*; Hoff. germ. 281. Roth. Germ. 1. 336. 2. 254. Allion. Ped. n. 805.) "Leaves smooth, sessile, lanceolate, pectinate-pinnatifid, quite entire towards the tip; stem erect, branched; calyxes pubescent." *Root* annual. Perfectly distinct from the next species, though it has a similar flower. A native of Germany and Italy. 22. *C. virens*. Linn. Sp. Pl. 9. Mart. 13. Lam. 11. Willd. 27. (*Hieracium minus glabrum, folis eleganter virentibus*; Bauh. Pin. 127. Tourn. 470. *Hedynois Plinii*; Lob. Ic. 229.) "Leaves runcinate, smooth, embracing the stem; calyxes somewhat tomentous." Linn. "Root-leaves toothed, somewhat lyrate, even-sur-faced; stem-ones half embracing the stem, narrow, toothed at the base; branches nearly naked, filiform." Lam. "Leaves smooth; lower ones remotely toothed; upper ones nearly entire, somewhat arrow-shaped; stem branched at the base, diffuse; calyxes pubescent." Willd. *Root* annual. *Stems* scarcely a foot high, slender, striated. *Root-leaves* about three inches long, six or eight lines broad. *Flowers* very small, yellow; peduncles almost capillary; outer scales of the calyx short, narrow, few;

CREPIS.

few; down of the feed capillary, sessile. A native of France and Italy, on walls, and by the sides of hedgcs. Nearly allied to *C. murorum*, but smaller in all its parts. 23. *C. Diaphoritis*. Linn. Sp. Pl. 8. Mart. 14. Willd. 28. (*C. virens* β; Lam.? *Hieracium majus erectum angustifolium*, caule laevi; Bauh. Pin. 127.) "Root-leaves runcinate; stem-ones hastate; calyxes somewhat tomentous." Lam. "Root-leaves lyrate-runcinate; stem-ones hastate, lanceolate; lower ones toothed; stem erect; branches divaricated; inner calyx roundish egg-shaped, angular." Willd. *Root* annual. *Stem* a foot high, somewhat angular, nearly even-surfaced. *Root-leaves* smooth, toothed, scarcely ciliated; stem-ones embracing the stem, purplish underneath, auricles at the base thickly toothed. *Flowers* yellow, purplish underneath; peduncles long, ascending, naked, one-flowered, scarcely thickened at the top; calyxes mealy, not nodding before the flower opens; calyx-scales tomentous, bristly at the back; outer ones filiform. A native of France, Siberia, and the Palatinate. Linnæus doubted whether this and the preceding are specifically distinct; Vailant, Haller, Gowan, and Vilars have actually united them. 24. *C. agrestis*. Willd. 23. Waldf. and Kitaib. Hung. "Root-leaves lanceolate-runcinate; stem-ones lanceolate, toothed at the base, arrow-shaped; flowers corymb-panicled; calyxes rough with hairs. *Root* annual. The wild plant is a foot and half high, and hispid; when cultivated it rises to the height of two feet, and becomes almost smooth. *Flowers* smaller than those of *C. tectorum*. A native of Hungary, on the borders of corn fields, and in dry meadows. 25. *C. biennis*. Linn. Sp. Pl. 14. Mart. 12. Lam. 13. Willd. 24. Hall. 30. Gært. tab. 158. fig. 2. Copied in Lam. Ill. Pl. 651. fig. 2. Eng. Bot. 149. (*Hedynnois biennis*; Hudf. 342. *Hieracium maximum*, *chondrilla folio*, *asperum*; Bauh. Pin. 127. Tourn. 470. Rai. Syn. 166.) "Leaves runcinate-pinnatifid, scabrous; lobes furnished with teeth, pointing upwards; calyx bristly, somewhat tomentous." *Root* biennial, spindle-shaped. *Stem* three or four feet high, erect, angular, leafy, rough with bristles, branched in the upper part, often purplish below. *Leaves* rough with whitish bristles; root and lower stem-ones petioled; upper ones lanceolate, pinnatifid at the base, embracing the stem; uppermost entire. *Flowers* large, yellow, in a kind of corymb; outer scales of the calyx loose, somewhat membranous at the edges, about half the length of the inner ones. *Receptacle* pitted; edges of the cavities ciliated. *Seeds* oblong, situated, smooth, more slender upwards, but not attenuated into a stipes; down sessile, capillary. A native of England, France, and other parts of Europe, chiefly in a chalky soil. 26. *C. scabra*. Willd. 25. "Leaves runcinate, hispid; stem-ones sessile; flowers in corymbs; calyx tomentous; outer scales pressed close to the others." *Stem* a foot high, striated, thinly clothed with very short hairs. *Root-leaves* two inches long, petioled, very rough with hairs, inversely egg-shaped; segments obtuse, somewhat toothed; stem-ones less hispid; lowest segments a little elongated; bracteal ones linear-awl-shaped, somewhat hastate at the base with linear auricles. *Flowers* yellow, about the size of those of *C. tectorum*, corymbed; peduncles white, with down; calyx downy, not bristly. A native of France. 27. *C. macrophylla*. Willd. 29. Desf. Atl. 2. 231. "Lower leaves ovate-oblong, hairy, unequally toothed; down stipitate, capillary." *Stem* a foot and a half or two feet high, erect, striated, branched, hairy, scabrous. *Leaves* clothed with short hairs; lower ones six or eight inches long; upper ones lanceolate, embracing the stem. *Flowers* numerous, yellow, the size of those of *C. biennis*, corymbed; outer calyx loose; scales

egg-shaped, smooth, membranous at the edges; inner one cylindrical; scales linear, acute, nearly equal, hirsute with short hairs. *Seed* elongated, slender, smooth. A native of Barbary about Algiers. 28. *C. pulchra*. Linn. Sp. Pl. 11. Mart. 15. Krok. Sues. 2. tab. 37. (*Chondrilla pulchra*; Lam. *Prenanthes hieracifolia*; Willd. *Chondrilla hieracii folio*, annua; Tourn. 238.) "Leaves arrow-shaped, toothed; stem panicled; calyxes pyramidal, smooth." *Root* annual. *Stem* three feet high, furrowed, leafy, smooth. *Leaves* roughish; root-ones six or seven inches long, and two broad, somewhat lyre-shaped, narrowed into a petiole; stem-ones embracing the stem, arrow-shaped acute, toothed towards the base. *Flowers* small, yellow, peduncled, in a loose terminal panicle; outer calyx-leaves very minute, close. *Down* of the feed capillary, sessile. A native of France, Italy, and Sicily. 29. *C. neglecta*. Linn. Mant. 15. Mart. 15. (*C. spatulata*; Lam.?) "Leaves embracing the stem, runcinate, somewhat hairy; stem panicled; inner calyxes with one or two weak spines on each scale." *Stem* a foot high, erect, somewhat hairy, branched. *Root-leaves* obovate-oblong, toothed, somewhat hairy; stem ones embracing the stem, runcinate, somewhat hairy, with elongated teeth even at the base; upper ones somewhat hastate. *Flowers* small, yellow; peduncles or flowering branches elongated, naked, even-surfaced, two-flowered or hispid; outer calyx-leaves very short, acute; inner ones eight or ten. *Root* annual. A native of Italy. Dr. Smith assures us that Willdenow has no good authority for asserting that, in the herbarium of Linnæus, a specimen of *C. nemausensis* is preserved under the name of *C. neglecta*. The latter is much more similar to *hieracium sanctum*, which Willdenow erroneously makes a synonym of *C. nemausensis*, but is quite distinct from both. 30. *C. succulenta* Hort. Kew. 13. (*C. coronopifolia*; Willd. 30. Desfont. act. soc. hist. nat. par. 1. 38. tab. 9. *Chondrilla hieracioides*; Roth. Cat. 1. 101. *Chondrilla tragopogonoides*; Bocc. mus. tab. 13.) "Leaves pinnatifid or toothed, somewhat fleshy; calyxes a little tomentous; down sessile." Hort. Kew. "Leaves pinnatifid; segments linear, root-ones toothed; stem-ones quite entire; stem panicled; calyxes tomentous; scales of the outer ones pressed close to the others." Willd. *Root* annual. A native of Madeira and the Canary Islands. 31. *C. tenuifolia*. Willd. 31. "Leaves pinnated; leaflets linear; root-ones toothed; stem panicled; calyxes pubescent; scales of the outer one reflexed." A native of Tauria? 32. *C. filiformis*. Willd. 32. Hort. Kew. 3. 1280. "Leaves linear-filiform, quite entire, smooth; down sessile." *Root* biennial. A native of Madeira.

CREPIS barbata; Linn. See *TOLPIS barbata*.

CREPIS pygmaea; Linn. See *HIERACIUM pumilum*.

CREPIS sibirica; Linn. See *HIERACIUM sibiricum*.

CREPIS, in *Gardening*, comprises plants of the herbaceous ornamental annual kind; of which the species mostly cultivated are; the Spanish bearded crepis, or purple eyed succory hawk-weed, (*C. barbata*;) and the purple crepis, (*C. rubra*.)

Method of Culture.—These, like other annual plants of the hardy kinds, must be raised by sowing the seed in either the autumn or spring, or both periods, where they are required to flower for a great length of time and in patches, in the clumps, borders, or other part where they are to remain, six or seven in each, covering them in lightly. When the plants have attained six or seven inches in growth, they should be thinned out, to three or four in each patch, and be kept free from weeds.

They are capable of succeeding in most soils and situations,

tions, having a pleasing effect in their flowers, in the fronts and other parts of the borders and clumps of ornamented grounds, as well as in many other places.

CREPITATION, that noise which some salts make over the fire in calcination; called also *detonation*.

CREPITATION is also used in *Surgery*, for the noise made by the ends or pieces of bones, when the surgeon moves a limb to assure himself by his ear of the existence of a fracture.

This is one of the evident indications of a fracture of bones; and to judge by it with the greater ease to the patient, it is necessary that the upper part of the limb be held fast, while the lower part is gently moved. The jar of the bones will likewise be sometimes felt by the hand, when nothing is heard.

CREPITUS LUPULI, in *Natural History*, a kind of fungus, popularly called *puff-ball*.

Mr Derham observes, that upon examining the powder thereof with a microscope, he found the seeds to be so many exceeding small puff-balls, with round heads, and long sharp-pointed stalks; as if made on purpose to prick into the ground.

The seeds become hurtful to the eyes, probably by their sharp stalks pricking and wounding them.

CREPON, in *Geography*, a town of France, in the department of the Caravos, and district of Bayeux; 2 leagues N E of Bayeux.

CREPSA, in *Ancient Geography*, an island of the Adriatic sea, according to Ptolemy; called *Cresa* by Pliny: now *Cherso*.

CREPSTINI, a people who inhabited the territory towards the mountains of the Rhine, according to the Pcutingerian table.

CREPUNDIA, in *Antiquity*, tokens left with exposed children, by which they might be afterwards known. These were of considerable value, if the child happened to be nobly born, in order to detract part of the expence of its education.

CREPUNDIA was also used, in a less proper sense, for the swaddling cloths in which children were exposed; because by them they might be known again. See *EXPOSING of children*.

CREPUSCULUM, in *Astronomy*, twilight; the time from the first dawn or appearance of the morning, to the rising of the sun: and again, between the setting of the sun, and the last remains of day.

Papius derives the word from *creperus*; which, he says, anciently signified *uncertain, doubtful, q. d. a dubious light*. "Res dubie creperæ vocantur," Censorinus. (Vid. Vossii Etymol.) It is called the *twilight* as being between or partaking of two lights, the light of the sun and that of the stars. (Skinneri Etymol.) The beginning of morning twilight is commonly called the day-break, day-spring, or dawning of the day. The crepusculum is usually computed to begin and end when the sun is about eighteen degrees below the horizon; for then stars of the sixth magnitude disappear in the morning, and appear in the evening. It is of longer duration in the solstices than in the equinoxes, and longer in an oblique than in a right sphere.

The crepuscula are occasioned by the sun's rays refracted in our atmosphere, and reflected from the particles thereof to the eye. For suppose an observer in O on the surface of the earth, O D F (*Plate V. Astronomy, fig. 38.*) B O A the sensible horizon, meeting in A the semicircle G A H I bounding that part of the atmosphere which is capa-

ble of refracting and reflecting light to the eye, and the sun under the horizon at S; and let the ray S E fall into the atmosphere below the horizon at E. Since it passes out of a rarer into a denser medium, it will be refracted towards the perpendicular, *i. e.* towards the semidiameter C E. It will not therefore proceed to T, but touching the sensible horizon; nor can any other ray b-fides A D, of all those refracted in E, arrive at A. But, since the particles of the atmosphere reflect the sun's rays; and since the angle D A C is equal to C A O, *i. e.* the angle of incidence equal to the angle of reflection, the rays reflected in A will be transmitted to O, the place of the spectator; who will therefore see the particle A shining in the sensible horizon, and consequently the beginning of the morning twilight. In the same manner might be shewn the refraction and reflection of the sun's rays in the atmosphere, in the evening twilight. The ray S E will be the first that reaches the eye in the morning, when the dawning begins, and the last that falls upon the eye at night, when the twilight ends; for when the sun is farther below the horizon the particles at A can be no longer illuminated. When the sun is not more than about 18° below our rational horizon, his rays in the morning first reach the eastern parts of the air within our visible horizon; as the time of his rising approaches, his light spreads farther round, and enlightens a larger portion of our air, and it becomes lighter and lighter, till sun-rise; in the same manner, after sun-set, the light gradually decreases, till the sun has descended so low that none of his rays can reach the western parts of the air within our visible horizon, or not in sufficient quantity to cause any sensible light there; and then the evening twilight ends: this happens when the sun's depression below the rational horizon is about 18°.

Kepler, indeed, assigns another cause of the crepusculum; *viz.* the luminous matter or atmosphere around the sun; which, arising near the horizon in a circular figure, exhibits the crepusculum; but it is in no respect, as he conceives, owing to the refraction of the atmosphere. The sun's luminous atmosphere, however, though neither the sole nor principal cause of twilight, may lengthen its duration, by illuminating our air, when the sun is too low to reach it with his own light. Greg. Ast. book ii. prop. 8.

The depth of the sun below the horizon at the beginning of the morning, or the end of the evening crepusculum, is determined in the same manner as the arch of vision; *viz.* by observing the moment wherein the air first begins to shine in the morning, and that wherein it ceases to shine in the evening; then finding the sun's place for that moment: and thence the time till his rising in the horizon, or from his setting in the evening.

Alhazen found it 19°; Tycho, 17°; Rothmannus, 24°; Stevinus, 18°; Cassini, 15°; Ricciolus, in the equinox in the morning 16°, in the evening 20° 30'; in the summer solstice in the morning 21° 25', in the winter solstice in the morning 17° 25'.

Nor need we wonder at this difference among astronomers; the cause of the crepusculum being inconstant: for, if the exhalations in the atmosphere be either more copious, or higher, than ordinary, the morning crepusculum will begin sooner, and the evening hold longer than ordinary: for the more copious the exhalations are, the more rays will they reflect, consequently the more will they shine; and the higher they are, the sooner they will be illumined

by

CREPUSCULUM.

by the sun. On this account, the evening twilight is longer than the morning, at the same time of the year in the same place. To this it may be added, that in a denser air, the refraction is greater: and that not only the brightness of the atmosphere is variable, but also its height from the earth: and therefore the twilight is longer in hot weather than in cold, in summer than in winter, and also in hot countries than in cold, other circumstances being the same. But the principal differences are owing to the different situations of places upon the earth, or to the difference of the sun's place in the heavens. Thus, the twilight is longest in a parallel sphere, and shortest in a right sphere, and longer to places in an oblique sphere in proportion to their nearness to one of the poles; a circumstance which affords relief to the inhabitants of the more northern countries in their long winter nights. And the twilights are longest in all places which have north latitude, when the sun is in the tropic of Cancer; and to those in south latitude, when he is in the tropic of Capricorn. The time of the shortest twilight is different in different latitudes; in England, it is about the beginning of October and of March, when the sun is in the signs \simeq and \times . Hence, when the difference between the sun's declination and the depth of the equator is less than 18° , so that the sun does not descend more than $18'$ below the horizon; the crepusculum will continue the whole night; which is the case in England from about the 22d of May to the 21st of July.

PROB. I. Given the Sun's declination, e. g. 10° N. and the latitude of the place, e. g. London, $51^\circ 32'$ N.; to find day-break, or the beginning of the twilight in the morning, and the end of twilight in the evening. In the oblique-angled spherical triangle, \odot Zenith N. (Plate V. Astronomy, fig. 39.) let $\odot N = 80^\circ$, the sun's distance from the north pole, i. e. $90^\circ - 10^\circ$; $\odot Z = 108^\circ$, the sun's distance from the zenith $= 18^\circ + 90^\circ$; $ZN = 38^\circ 28'$, the complement of the latitude; to find the angle Zenith N \odot , measured by the arc $a \text{ } \odot$ the time from noon. The solution of the problem by spherical trigonometry, will be as follows.

$\odot N = 80^\circ$	$\text{Co-sec. } ZN = 38^\circ 28'$	$.20617$	}	r indices.
$\odot Z = 108^\circ$	$\text{Co-sec. } \odot N = 80^\circ$	$.00665$		
$ZN = 38^\circ 28'$	Sine $113^\circ 14'$	996327		
2 226. 28	Sine $5^\circ 14'$	896005		
Half sum 113. 14	2 19. 13614			
$\odot Z = 108. 0$	Cofine $68^\circ 17'. 29''$	9.56807		
Remainder 5. 14	2			

Angle $\odot NZ = 136^\circ 34'. 58'' = 9^h. 6'. 20''$, time

from noon when the sun is 18° degrees below the horizon. Consequently the day breaks at $2^h. 53'. 40''$ in the morning, and twilight ends at $9^h. 6'. 20''$ in the evening, supposing the sun's declination to undergo no change between the beginning of twilight in the morning, and the ending thereof at night, being about 18 hours.

The same things might have been found from the triangle $\odot S$ Nadir, for $S\odot = 90^\circ + 10^\circ = 100^\circ$, Nadir $\odot = 180^\circ - 108^\circ = 72^\circ$, and Nadir $S = \text{comp. lat.} = 38^\circ 28'$. Then by the method above find the angle $\odot SN$ (measured by the arch $a Q$) $= 43^\circ 25'. 12'' = 2^h. 53'. 40''$ as before, the time from midnight, when the sun is 18° below the horizon.

Supposing that the sun's declination were 10° S, and the place the same, we shall have in the triangle $\odot S$ Nadir, the sun being on the south side of $\text{ } \odot Q$;

$\odot S = 90^\circ - 10^\circ = 80^\circ$	$\text{the sun's dist. from the south pole,}$		
\odot Nadir $= 180^\circ - 108^\circ = 72^\circ$	$\text{the sun's dist. from the Nadir.}$		
S Nadir $= \text{comp. lat.} = 38^\circ 28'$	$\text{Co-sec. } \odot S = 80^\circ$	$.00665$	
	$\text{Co-sec. } S$	$.20617$	
2 190. 28	Nad. } $= 38^\circ 28'$	$.20617$	
Half sum 95. 14	Sine $95^\circ 14'$	999819	
\odot Nadir $= 72. 0$	Sine $23^\circ 14'$	9.59602	
Rem. 23. 14	2 19. 80703		
	Cofine $36^\circ 47'. 47''$	9.90351	

Angle $\odot SN = 73. 35. 34 = 4^h. 54'. 22''$

the time from midnight when the sun is 18° below the horizon. Consequently day breaks at $4^h. 54'. 22''$ in the morning, and twilight ends at $7^h. 5'. 38''$ in the evening. Admitting the sun's declination constant for 1 day.

Again, if the sun's declination were $23^\circ 28'$ S, and the latitude of the place the same, we shall have in the triangle $\odot S$ Nadir, the sun being, as before, on the south side of $\text{ } \odot Q$;

$\odot S = 90^\circ - 23^\circ 28' = 66^\circ 32'$	$\text{the sun's distance from the south pole,}$		
\odot Nadir $= 180^\circ - 108^\circ = 72^\circ$	$\text{the sun's distance from the Nadir.}$		
S Nadir $= \text{comp. lat.} = 38^\circ 28'$			
	Half sum $88^\circ 30'$		
2 177. 0	\odot Nadir $= 72. 0$		
	Rem. 16. 30		
	Half sum 88. 30		
	Co-secant $\odot S = 66^\circ 32'$	$.03749$	
	Co-secant S Nadir $= 38^\circ 28'$	$.20617$	
	Sine 88. 30'	9.99985	
	Sine 16. 30'	9.45334	
	2 19. 69685		
	Cofine $45^\circ 8'$	9.84842	

Angle $\odot SN = 90^\circ 16' = 6^h. 1'. 4''$, the time

from midnight when the sun is 18° below the horizon. Consequently day breaks at $5^h. 58'. 56''$, and twilight ends at $6^h. 1'. 4''$ on the shortest day at London.

When the declination of the sun, the latitude and declination being of the same name, is greater than the difference between the complement of latitude and 18° , the parallel of declination (\odot SSS \odot) will not cut the parallel of 18° ($\text{ } \odot$ FW) below the horizon: consequently there will be no real night at these times, but constant day or twilight, as is the case at London from the 22d of May to the 21st of July.

Since the sun sets more obliquely at some times of the year than at others, it necessarily follows that he will be longer in descending 18° below the horizon at one season than another.

When the sun is on the same side of the equator as the visible pole, the duration of twilight will constantly increase as he approaches that pole, till he enters the tropic, at which time the duration of twilight will be the longest. It will then decrease till some time after the sun passes the equinox, but will increase again before he arrives at the other tropic; therefore, there must be a point between the tropics, where the duration of twilight is the shortest.

PROB.

PROB. II. To find the Sun's declination at the time of the twilight. Let *ab* (fig. 40.) be the parallel of the sun's declination at the time required; draw *ed* indefinitely near, and parallel to it, and *TW*, a parallel to the horizon, 18° below it; then *vPW*, *vPT* measure the twilight on each parallel of declination; and when the twilight is shortest, the increment of the hour angle being = 0, these must be equal; hence, *vPr* = *vz*, and therefore *vr* = *vz*; and as *rs* = *tz*, and the angles *r* and *z* are right angles, *rvs* = *zvt*; but *Pvr* = 90° = *Zvs*, and taking *Zvr* from each, *PvZ* = *rvs*: for the same reason, *PwZ* = *zvt*; hence *PvZ* = *PwZ*. Take *vce* = *vZ* = 90°, then as *Pv* = *Pw*, and the angle *Pve* = *PwZ*, therefore *Pe* = *PZ*; let fall the perpendicular *Py*, and it will bisect the base *eZ*. Then, by trigonometry, $\text{cof. } P y = \frac{\text{cof. } P v}{\text{cof. } v y} = \frac{\text{cof. } P v}{\text{fin. } e y}$; also, $\text{cof. } P y = \frac{\text{cof. } P e}{\text{cof. } e y} = \frac{\text{cof. } P Z}{\text{cof. } e y}$; hence $\frac{\text{cof. } P v}{\text{fin. } e y} = \frac{\text{cof. } P Z}{\text{cof. } e y}$; therefore $\text{cof. } P v$, or $\text{fin. } h v$, = $\text{cof. } P Z \times \frac{\text{fin. } e y}{\text{cof. } e y} = \text{cof. } P Z$

× $\text{tang. } e y$: hence $\text{rad.} : \text{cof. } P Z$, or $\text{fin. } \text{lat.} :: \text{tang. } e y = 9^\circ : \text{fin. } h v$, the sun's declination at the time of shortest twilight. Because *PZ* is always less than 90°, and *Zy* = 9°, therefore *Py* is always less than 90°, and therefore its cosine is positive; also *vy* is always greater than 90°, therefore its cosine is negative: hence $\text{cof. } P v$ (= $\text{cof. } P y \times \text{cof. } v y$) is negative; consequently, *Pv* is greater than 90°, and therefore the sun's declination is south. N. B. This is M. Cagnoli's investigation, cited by Vince. Astr. vol. i. p. 18.

To find the duration of the shortest twilight. As *vPZ* = *vPe*, therefore *ZPe* = *vPw*, measuring the shortest time. Now $\text{fin. } P Z$, or $\text{cof. } \text{lat.} : \text{rad.} :: \text{fin. } Z y = 9^\circ : \text{fin. } Z P y$, which doubled gives *ZPe*, or *vPw*, and this converted into time gives the length of the shortest twilight.

E. G. At London, N. lat. 51° 32', it is required to find the sun's declination, day of the month, and duration of twilight, when it is the shortest. For the declination:

Rad.	10 000000
Sin. 51° 32'	9.8937452
Tang. 9°	9.1997125
Sine of 7° 7' 25"	9.0934577
Cof. 51° 32'	9.7938317
Rad.	10.0000000
Sin. 9°	9.1943324
Sin. 14° 34'	9.4007007

This doubled gives 29° 8', which converted into time, gives 1^h 56' 32" for the duration of the shortest twilight, supposing it to end when the sun is 18° below the horizon. It may be also found by taking the difference between the time of sun-rise, and day-break, ascertained for the given declination.

PROB. III To find the Sun's declination, when it is just twilight all night. In this case, the sun at *a* (fig. 41.) must be 18° below the horizon; hence 18° + the declination *Qa* = *RQ* = *EH* = *comp. of lat. of place*; hence the sun's declination = *comp. lat.* - 18°. Find therefore in the "Nautical Almanac," or any good Ephemeris, on what

days the sun has this declination, and you have the time required. The sun's greatest declination being 23° 28', it follows that if the complement of the latitude be greater than 41° 28', or if the latitude be less than 48° 32', there can never be twilight all night. If the sun be on the other side of the equator, then its declination = 18° - *comp. lat.* "Gregory's Astron." b. ii. prob. 41. "Vince's Astronomy," vol. i. p. 18, 19. "Robertson's Nav." b. v. prob. 12. "Keith's Trigonometry," book iii. chap. 2.

To find the beginning and end of twilight by the artificial globe. Rectify the globe for the latitude of the place, bring the sun's place on the given day to the meridian; set the hour-index at 12, then turn the globe towards the east till the point of the ecliptic opposite to the sun's place is 18° above the west side of the horizon; the sun's place is then 18° below the east side, and the morning twilight begins, the index pointing at the hour. By a similar method the time of the ending of the evening twilight is found by turning the globe till the point of the ecliptic opposite to the sun's place on the given day be 18° above the east side of the horizon; the sun's place will then be 18° below the west side of the horizon, when the evening twilight ends, the hour-index shewing the time.

Supposing the depression of the sun at which twilight begins or ends to be 18°, it is easy to determine the height of the atmosphere. Let *A E F G* (Plate V. Astronomy, fig. 42.) be the earth, the pointed circle surrounding it the outward surface of the atmosphere, the height of which *DB* is to be found: let *A* be the place of an observer, *bo* his sensible horizon, *HO* his rational horizon; let *I K L M* be the sun, *E N G* the shadow of the earth, *l B* a ray from the upper edge of the sun, touching the earth in *E*, and falling upon the outward surface of the atmosphere at *B*, whence it is reflected to the eye of the observer at *A* in the line of his sensible horizon *B A*: since the sun is larger than the earth, he enlightens a little more than a hemisphere, or that part represented by the arc *E F G* = 180° 32', because, *E C F* + *E C N* = two right angles, and *E C N* is less than a right angle by the angle *E N C* = 16'; consequently, the half of *E F G* or the angle *E C S* = 90° 16'; and therefore taking away *O C S* the sun's depression = 18°, there will remain *E C O* = 72° 16'; and as *A C O* = 90°, *A C E* will be = 17° 44', and *D C A*, its half = 8° 52'. Then in the right-angled triangle *B A C*, the angles and one side *A C* are known, therefore the side *BC* may be found. *A C* being made radius, *BC* will be the secant of the angle *B C A* = 8° 52': therefore 10000000 : 10120948 :: 3967½ the miles in the earth's semidiameter : 4015½ the distance from the centre to the outward surface of the atmosphere, from which subtract the semidiameter, and the remainder, 48 miles, will be the height of the atmosphere. If allowance of 34' is made for the horizontal refraction, the angle *B C A* will be 8° 18', the secant of which is 10105851, whence the height of the atmosphere will be about 42 miles. "Long's Astr." vol. i. p. 260. See ATMOSPHERE.

CREPUSCULUM is sometimes used to denote a small circle drawn parallel to the horizon at 18° below it, where the twilight begins and ends.

CREPY EN LAONNOIS, in Geography, a town of France, in the department of the Aisne, and district of Lafen; 1½ league N.W. of Laon.

CRESCENCI, GIO. BATISTA, in Biography, a Roman marquis, born about the year 1597, who studied painting and architecture under the cavalier Pomerancio. He is said to have designed with much correctness; but he is principally distinguished as a patron of the fine arts, to the advancement of which he devoted his time and his fortune.

Pope Paul V. made him superintendant of the works then constructing in Rome. Crescenci afterwards went to Spain, where he was employed in forwarding the works of the Escorial; besides which he built the tomb of Philip III. He is said to have painted flowers with considerable ability. He died at Madrid in 1660. Lanzi.

CRESCENDO, *Ital.*, from *crefcere*, to increase, a term in *Musical*, unknown till about the middle of the last century. We had long before that time *piano* and *forte*, with their several shades of *piu piano*, and *pianissimo*, *piu forte* and *fortissimo* (which see); but it seems as if Jomelli, who had a good band to write for at Stutgard, introduced the terms *crefcendo* and *diminuendo* into Germany; and they were soon adopted by the symphonists of the Manheim school, such as the elder Hamitz, Holtzhamr, Canabich, Toefchi, Funzt, Filtz, &c. who tried experiments on the minute augmentation and diminution of an orchestra in the aggregate, and succeeded so well as to establish the practice throughout Europe.

The first time we recollect hearing it in England was in an air by J. Chr. Bach, composed for the celebrated tenor, Raaf, to sing at Manheim; but sung here by Ciprandi, an excellent tenor. The words were Metastasio's, in Ezio: "Non so donde vieni quel tenero affetto." This is the history of *crefcendo* and *diminuendo*, which have introduced as much chiar' oscuro in music as painting could boast. A keyed instrument, but above all an organ, by which the *crefcendo* could be obtained, is a grand desideratum in music. Grey has in some degree acquired this power, by a swell of the whole instrument.

CRESCENT, formed from *crefcere*, I grow, in *Astronomy*, the new moon, which, as it begins to recede from the sun, shews a little rim of light, terminating in points, or horns, which are still increasing, till it becomes full and round in the opposition.

The term is also used for the same figure of the moon in its wane, or decrease, but improperly; because the points or horns are then turned towards the west, whereas they look to the east in the just crescent, and because the figure is on the decrease.

CRESCENT, in *Geography*, an island of the South Sea, so called on account of its form, 6 or 7 miles in circumference, and lying in S. lat. 23° 22'. E. long. 225° 30'. The shore of this island is grey coral sand and stones, thrown up by the violence of the sea, forming a wall at the S.E. point, about 20 or 30 feet above the surface; and on this point were three piles of coral stones, two of which were built round and small, and one square, the sides of which might be about 12 feet and 6 in height, with a hole at one side, seemingly for the convenience of creeping into the hole. The natives seen by the missionary voyagers were 25, including three or four women carrying children at their backs; and these were probably all that inhabited the island. They are of a light copper colour and middling stature. The accent of their language is similar to that of the other islanders with whom these voyagers were acquainted. Some were quite naked, except a piece of cloth round their middle; others had a long piece of cloth thrown over their shoulders, and reaching half way down the leg: one, who was perhaps the chief, wore a piece of very white cloth round his head, in form of a turban. They did not seem to have any ornaments. It was difficult to imagine on what they subsisted, as they have neither bread-fruit, cocoa-nuts, nor any fruit-trees whatever: nor on the whole island could one canoe for fish be perceived; so that they must be either transient vi-

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sitors, or, if permanent settlers, miserably provided with means of subsistence. Mission. Voy. p. 116.

CRESCENT, in *Heraldry*, is a bearing in form of a half-moon. The Ottomans bear sinople, a crescent montant, argent.

The crescent is frequently used as a difference in coat-armour, to distinguish it for that of a second brother, or junior family.

The figure of the crescent is the Turkish symbol; or rather, is that of the city Byzantium, which bore this device from all antiquity; as appears from medals struck in honour of Augustus, Trajan, &c.

When the Tartars, to whom Muscovy was subject 200 years, converted any of the churches into mosques for the use of their own religion, they fixed the crescent, the badge of Mahometanism, upon them; and when the grand duke Ivan Basiovitch had delivered his country from the Tartar yoke, and restored these edifices to the Christian worship, he left the crescent remaining, and planted a cross upon it as a mark of its victory over its enemy. See King's Rites and Ceremonies of the Greek Church, p. 23.

The crescent is sometimes *montant*, i. e. its points look toward the top of the chief, which is its most ordinary representation; whence some contend, that the crescent, absolutely so called, implies that situation; though other authors blazon it *montant*, when the horns are toward the dexter side of the escutcheon, in which position others call it *incroissant*.

Crescents are said to be *adossed*, when their backs or thickest parts are turned toward each other; their points looking to the sides of the shield.

Crescent *inverted*, is that whose points look toward the bottom: *turned* crescents are placed like those *adossed*; the difference is, that all their points look to the dexter side of the shield: *conturned* crescents, on the contrary, look to the sinister side: *affronted* or *appointed* crescents are contrary to the *adossed*, the points looking toward each other.

CRESCENT is also the name of a military order, instituted by Charles I. king of Naples and Sicily, in 1268, who gave the knights a collar of fleurs-de-lis, and stars intermixed, and pendent to it a crescent with this motto, "Donec impleat orbem." The order was revived by Renatus of Anjou, &c. in 1464; the badge, or symbol thereof being a crescent of gold enamelled; on which was engraved, *lox, praise*: which, in the style of rebus, makes *lox in crescent*, q. d. *by advancing in virtue, one merits praise*.

CRESCENT, in *Military Language*, an order of battle among the Turks, in which they encamp as well as engage; similar to which was that called by Frontin, "lunata acies," in which a general keeps back his centre, in order to advance his two wings: an example of which occurs in the battle between P. Scipio Africanus and Asdrubal. In this order it appears to have been the aim of a general to avoid engaging in the centre, either because he had weakened it with a view of strengthening his wings, or because he had discovered that the enemy intended to open the action by attacking it. The Turks, in their crescent, propose to surround the enemy with their wings; but, at the same time, they wish to draw him to their centre, where they always place such of their troops as warrant their chief confidence. M. de Maizeroy observes, that the order of the crescent is fit for none but the large armies of rich and populous states; the object of it being to bring a great number of troops to bear against a small one, surround them, and then, as it were, trample them under foot. See TURKS. The Moors also, whose armies are very numerous, and consist chiefly of

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cavalry,

cavalry, draw them up on the same principles with the Turks, and, like them, use the crescent. Of this we have a remarkable instance in the battle of Alcazar, between the Portuguese and the Moors, in which Don Sebastian, king of Portugal, perished with his whole army. The Moorish king, Muley-Moluc, though in a dying state, drew up his troops by his own special orders, and expecting to expire in battle, gave strict command that his death should be concealed, and that his aids-de-camp should ride up close to his litter, and appear to be receiving his orders as usual. He was then carried through all the ranks of his army, where, by his presence and the signs he made to them, he inspired his soldiers with a generous resolution to fight bravely for the defence of their country and religion. The Portuguese, unapprized of any extraordinary art or design in the disposition of the Moorish troops, advanced directly into the hollow of the crescent; and Moluc allowed them to approach, till he saw them near enough to be ferounded: he then gave a signal, upon which all the lines of cavalry, polled on his wings and in his rear, extended themselves, and formed an oval, in which they entirely pent up the Christian army. As soon as the two extremities of the crescent were thus joined, the Moors closed in, and contracted the circumference of their oval, according to a manœuvre to which they were accustomed; and at the same time their artillery began to do its duty. After a very severe engagement, in which great bravery was manifested on both sides, the Moors obtained a complete victory. See Maizeroy's System of Tactics by Maute, vol. ii.

CRESCENT-Shaped, lunatum, or more properly lunulatum folium, in Botany, is applied to that very unusual form of a leaf which resembles a half-moon, whether the points or horns be directed forwards, from the foot-stalk, as in Passiflora lunata, or backwards, towards that part, like some leaves of Sagittaria obtusifolia, and the leaflets, occasionally, of Osmunda Lunaria, or moonwort, a fern so denominated from this resemblance, which however is very slight and uncertain. S.

CRESCENTIA, (from Pietro Crescentio, an Italian writer on agriculture towards the end of the thirteenth century.) Linn. Gen. 762. Schreb. 1021. Willd. 1160. Juss. 127. Vent. 2. 378. Calabash tree. Calabassier, Couis; Fr. Class and order, *dialyspermia angiosperma*. Nat. Ord. *Putaminee*? Linn. *Solanis affinis*, Juss.

Gen. Ch. Cal. Perianth one-leaved, two-parted, short, deciduous; divisions oval, obtuse, concave, equal. Cor. monopetalous, somewhat campanulate, irregular; tube short, inflated on one side, curved or somewhat twisted; border five-cleft; divisions unequal, toothed, undulated. Stam. Filaments four, (sometimes five; Jacq.) the length of the corolla, two shorter than the others, a little curved; anthers incumbent, oblong, obtuse. Pist. Germ superior, egg-shaped, pedicelled; style long; stigma thick, capitate. Peric. Berry large, oval, hard, one-celled. Seeds numerous, two-celled, bedded in the pulp.

Ess. Ch. Calyx two-parted, equal. Corolla gibbous. Berry one-celled, pedicelled. Seeds numerous, two-celled.

Sp. 1. *C. cujete*. Linn. Sp. Pl. Mart. 1. Lam. 1. Willd. 1. "Leaves wedge-lanceolate; fruit obtuse; seeds heart-shaped." 2. *Cucurbitifera arbor, folio longo mucronata*; Pluk. Alm. 123. tab. 171. fig. 1. Comm. Hort. 1. 137. tab. 71. Jacq. Amer. 175. tab. 111. A tree about the height of our pear-tree, and nearly as thick as the human body. Trunk crooked, dividing at the top into numerous, very long, thick, nearly simple, almost horizontal branches. Leaves fascicled, nine or ten together at irre-

gular distances, from five to seven inches long, about an inch broad, narrowing very gradually towards the base, almost sessile, terminating in a long point, entire, smooth, rather shining. Flowers on the trunk and branches, pale white, solitary, of a disagreeable smell; peduncles thick, an inch long. Fruit varying in size and figure on different trees, roundish, from two inches to a foot in diameter, without a point or nipple at the summit, covered with a thin greenish-yellow skin, which encloses a thin, hard, almost woody shell, containing a pale yellow, soft, juicy pulp, of an unpleasant taste. The shell, stripped of the external skin, and emptied of its juice, is used in the West Indies, according to its size, for various kinds of domestic vessels, such as water-cans, goblets, coffee-cups, and, it is said, even for kettles to boil water in, it being so thin, hard, and close-grained, as to stand the fire several successive times before it is destroyed. In the Carolinas and Georgia, there is a vessel of water set in a cool part of every house, with a calabash, prepared for the purpose, swimming in it, for the family to drink out of, as often as they think fit. Its external surface is sometimes finely polished, and ornamented with engraved figures, which are variously coloured with indigo, and other pigments. The pulp is esteemed by the natives a sovereign remedy in several disorders: taken internally, it is supposed to cure dropics, diarrhœas, and inflammations of the chest; applied externally, it is thought serviceable in bruises, burns, and headaches. A native of the West Indies, New Spain, and Guiana. 3. *Cucurbitifera arbor, subrotundis foliis confertis*; Pluk. Alm. 124. tab. 171. fig. 2. Rai. Hist. 1667. Leaves shorter than those of the preceding variety, completely wedge shaped, ending in a very short obtuse point, sessile, fascicled. Fruit often larger than the human head. A native of the same countries. 4. *Cujete minima fructu duro*; Plum. Gen. 23. A middle-sized shrub, with stiff and widely spreading branches. Leaves constantly fascicled, linear-lanceolate, of unequal size, some in the same fascicle being scarcely half an inch long, and others an inch and half, not acuminate. Fruit resembling those of the preceding varieties, but scarcely larger than a pigeon's egg. A native of St. Domingo. According to Du Tour in Nouveau Dictionnaire, it is properly a distinct species. 5. *C. cucurbitina*. Linn. Mant. 250. Mart. 2. Willd. 2. (*C. cujete* 3; Linn. Sp. Pl. *C. latifolia*; Mill. Lam. 2. 111. Pl. 547.; but not the section of the fruit 2, nor the separate seeds *f*, which belong to *C. cujete*. *Cujete latifolia, fructu putamine fragili*; Plum. Gen. 23. Burm. Amer. tab. 109.) "Leaves egg-shaped, petioled, alternate; fruit egg-shaped, acuminate; seeds orbicular, compressed." A middle-sized tree, with a large umbrageous head, nearly upright branches, and a trunk considerably thicker than the human body. Leaves about six inches long and three broad, not fascicled, entire, quite smooth, shining, ending in a short point, on short petioles. Flowers whiter than those of the preceding species. Fruit nearly the shape of a citron, but larger, with a thin brittle shell and whitish pulp. Seeds brown, two-lobed, bitter. A native of St. Domingo. 6. *C. jasminoides*. Lam. 3. (*Arbor jasmini floribus albis*; Catf. Car. 1. 59.) "Leaves wedge-shaped, obtuse, emarginate; flowers funnel-shaped; border equal, five-cleft." A shrub, six or seven feet high, with a stem not thicker than the human finger. Leaves nearly the size of those of the common laurel, coriaceous, stiff, a little folded back at the edges. Flowers in terminal branches, resembling those of the common jasmine, white, with a mixture of red. Fruit yellowish-green, oval, obtuse, peduncled, about the consistence of a soft pear, and containing a pulp not unlike cassia in taste and

and colour. *Seeds* blackish, small, oval or rhomboid. A native of the Bahama Islands. La Marek and Jusſieu have both expreſſed a doubt whether this plant be really a creſcentia; and Ducour is of opinion that it ought to be referred to another genus.

Propagation and Culture.—The calabash tree, being a tropical plant, muſt be raiſed and conſtantly kept in the ſtove. It is eaſily raiſed from ſeed brought over in the ripe fruit. In winter it ſhould be placed in the tan-bed, and ſhould have but little water; in ſummer it requires to be watered two or three times a week, and in hot weather ſhould have a good deal of freſh air. The firſt two ſpecies have been long cultivated in England, but, we believe, have never yet flowered.

CRESCENTIA, in *Gardening*, comprises a plant of the exotic tree kind, the narrow-leaved calabash tree (*C. cujete*). There is alſo a broad-leaved variety, which may likewiſe be cultivated.

Method of Culture.—This ſpecies and variety of the calabash tree are capable of being increaſed by ſowing the ſeeds, procured from the places of their native growth, as ſoon as they are obtained, in pots of light, freſh, rich earth, plunging them into a bark hot-bed. When the plants have attained two or three inches in growth, they ſhould be removed into ſeparate pots of a ſmall ſize, replanting them in the hot-bed. They ſhould be kept in the hot-bed of the ſtove, and have the management of other tender plants of ſimilar growth. In this climate theſe plants have only a ſhrubby growth, being chiefly introduced for the purpoſe of varieties among ſtove-plants.

CRESCENTINO, in *Geography*, a ſmall town of France, in the department of Seſia, which was formerly a part of Piedmont in Italy. It is the chief place of a canton, in the diſtrict of Santhia, with a population of 3962 individuals. The canton itſelf has but 5 communes, and 8175 inhabitants. Creſcentino is ſituated on the river Po, 24 miles N.E. of Turin.

CRESCENZI, DEL BARTOLOMMEO, in *Biography*, fo called from his patron mentioned in a former article. His true name was *Cavarozzi*, and he was born in Viterbo. Bartolommeo was one of the beſt ſcholars of Pomerancio, whoſe ſtyle he ſtudied with great ſucceſs. His beſt works are at Viterbo, where his cabinet pictures are much eſteemed. He died young, in 1625. Baglione.

CRESELLA, a fair Grecian, who chifſelled ſeven ſtatues of Amazons for the temple of Diana at Ephelus. She was accounted the third in merit amongſt the numerous competitors who vied in decorating that famed edifice, being only inferior to Policletus and Phidias. Borghini.

CRESIUS MONS, in *Ancient Geography*, a mountain of Arcadia, N.E. of Megalopolis, and near Tegæa, upon which was a temple of Mars, mentioned by Pauſanias.

CRESPI, BENEDETTO, called *Il Buſtini*, in *Biography*, a painter who flouriſhed in the 17th century. He was a native of Como, and is ſaid to have poſſeſſed no mean abilities. He had a ſon, named Antonio Maria, to whom he taught the principles of his art. Orlandi.

CRESPI, GIO. BATISTA, an artiſt of conſiderable repute, called *Il Cerano* from the place of his birth, a ſmall town near Novara, in the ſtate of Milan. Creſpi was born in the year 1557, and at an early age was taught the art of deſign. His parents ſent him to Rome, and afterwards to Venice; at both which places he ſtaid ſome time to ſtudy the compositions of the moſt eminent maſters. Upon his return, he eſta bliſhed himſelf at Milan, where he acquired the favour of the reigning duke. This prince conferred on our artiſt a penſion and many honours, which were continued to him until the year of his death, 1633.

Gio. Batista Creſpi, was a ſkilful architect, and modelled with great ability. As a painter he poſſeſſed conſiderable talents, joined to great faults. His inventions are novel, his groups well diſpoſed, and his works poſſeſs great force of chiaro-ſcuro; but ſometimes from an affectation, either of grace or grandeur, the attitudes of his figures are extravagant, and the naked parts exaggerated and heavy. One of his beſt pictures is the Madonna del Roſario, in the church of St. Lazzaro at Milan. He was ſome time director of the academy of that city. Lanzi.

CRESPI, DANIELLO, a painter of whom the abbé Lanzi ſpeaks in the higheſt terms, though his works are little known out of the ſtate of Milan. He was born in that city about the year 1590, and at a proper age became the pupil of Gio. Batista Creſpi. He afterwards ſtudied under Camillo Procaccini, and is by many ſuppoſed to have equalled, if not to have excelled, that maſter. Creſpi and his whole family were ſwept away by the plague which raged at Milan in the year 1630.

One of his beſt pictures is the Taking down from the Croſs, in the church Della Paſſione at Milan; but even this is excelled by his laſt works, finiſhed in 1629, repreſenting ſtories of the life of St. Bruno, in the church of the Certosa in the ſame city. Lanzi.

CRESPI, GIUSEPPE MARIA, whom his companions called *Lo Spagnuolo*, from the ſtyle in which he affected to dreſs, a Bologneſe painter of conſiderable eminence, born in 1665. At a very early age he was placed under the tuition of Domenico Canuti, and afterwards became the pupil of Cignani. After having ſtudied the works of the Caracci, and other Bologneſe painters at Bologna, he travelled to Venice, and afterwards to Modena and Parma, where he contemplated thoſe of the divine Correggio. The compositions of Baroccio in Urbino and Pefaro next drew his attention; his deſign being to form a ſtyle of his own, by uniting, as far as he was able, the various excellencies of theſe different maſters.

Giuseppe returned to Bologna, where the fame of his abilities cauſed him to be employed by the principal nobility, for whom he executed many conſiderable performances. He ſpent in that city the remainder of a long life with undimiſhed reputation, and died in 1747.

The talents of this artiſt were of the moſt verſatile kind. His pencil poſſeſſed a facility which delighted to blend the comic even with his moſt ſerious ſubjects. He frequently deſigned caricatures, which he engraved with his own hand. A certain caprice and affectation of novelty diſtinguiſh his pictures, which are very numerous, and diſperſed into different parts of Europe. The gallery of Dresden contained ſome of the moſt eſteemed; amongſt which are the following: “the Seven Sacraments,” in ſeven pieces; “the Virgin, Chriſt, and St. John;” “an Ecce Homo, attended by two Soldiers.” Orlandi. Lanzi.

CRESPI, ANTONIO, and LUIGI, ſons of the laſt-mentioned artiſt, and named as ſome of the beſt of their father’s ſcholars; but though their works were much ſtudied, and compoſed with more ſobriety than thoſe of their father, they never attained his eminence in the art. Luigi, indeed, quitted the pencil for the pen, and wrote many conſiderable works relating to the arts; and amongſt others, the Supplement or 3d volume of the “*Felina Pittrice*.” He died in 1779, and Antonio ſurvived him only three years. Lanzi.

CRESPINI, DE’, MARIO, a painter of the Milanefe ſchool, who flouriſhed about the year 1720. He was a native of Como, and diſciple of Maderno, an artiſt of that city, who is known by his pictures of ſtill life. He, how-

ever, excelled his master in painting flowers, kitchen utensils, &c. after the manner of Bassan. His works are in some estimation in the state of Milan. Lanzi. Orlandi.

CRESPY, or CREPY, JEAN, and LOUIS, engravers and print merchants, who flourished in Paris at the commencement of the 18th century. We have many portraits by these hands, besides numerous plates from Albano, Le Brun, Guillot, &c. Amongst them are the following: "a Head of the Duke of Marlborough," a small upright plate; "a Ditto of Mahomet Effendi, the Turkish Ambassador in France." Heinecken.

CRESPY, in Latin *Crespitiacum*, in *Geography*, a small town of France, in the department of the Oise, 15 miles S. of Compiègne, and 45 N.E. of Paris. It is the chief place of a canton, in the district of Senlis, and contains 2305 inhabitants. The canton itself has 30 communes, and counts a population of 11,401 individuals, upon a territorial extent of 242 kilometres and a half.—Also, a commune in the department of Aisne, 6 miles N. of Laon. Crespy is famous for the peace concluded here, September 18th, 1544, between the emperor Charles V. and Francis I. king of France; for the articles of which, see Robertson's Hist. of Charles V., vol. iii. p. 301.

CRESS, in *Botany*, an English name given to various plants of the class tetradynamia, many of which are eaten in fallads.

CRESS, *Bastard*. See several species of THLASPI.

CRESS, *Bristol Rock*. See ARABIS *strigata*.

CRESS, *Early Winter*, or *Bellife*. See ERYSIMUM *pratense*.

CRESS, *Fine*. See LEPIDIUM *petraeum*.

CRESS, *Garden*. See LEPIDIUM *fativum*. This is the kind commonly used as an ingredient in spring fallads.

CRESS, *Hoary*. See THLASPI *hirtum*.

CRESS, *Indian*. See TROPÆOLUM.

CRESS, *Irish Rusb*. See SUBULARIA *aquatica*.

CRESS, *Narrow Wild*. See LEPIDIUM *sudemale*.

CRESS, *Penny*. See THLASPI *arvense*.

CRESS, *Rock and Shepherd's*. See IBERIS *nudicaulis*.

CRESS, *Speedwell*. See DRABA *muralis*.

CRESS, *Swine's*. See CORONOPUS *ruellii*.

CRESS, *Tower-wall*. See ARABIS *turrita*.

CRESS, *Wall*. See ARABIS *italiana*.

CRESS, *Water*. See SISYMBRIUM *nasturtium*.

CRESS, *Winter*. See ERYSIMUM *barbarea*.

CRESSA, (an adjective, denoting a native of Crete.) Linn. Gen. 313. Schreb. 439. Willd. 502. Juss. 134. Vent. 2. 397. Class, *pentandria digynia*. Nat. Ord. *Undetermined*, Linn. *Convulvuli*, Juss.

Gen. Ch. *Cal.* Perianth five-leaved; leaves egg-shaped, obtuse, incumbent, permanent. *Cor.* monopetalous, falver-shaped; tube the length of the calyx, bellied below; border with five egg-shaped, acute, spreading divisions. *Stam.* Filaments five, capillary, long, attached to the tube of the corolla; anthers roundish. *Pistl.* Germ superior, egg-shaped; styles two, filiform, the length of the stamens; stigmas simple. *Peric.* Capsule egg-shaped, one-celled, two-valved, a little longer than the permanent calyx. *Seeds* ovate-oblong, solitary, or four in each capsule.

Eff. Ch. Calyx five-leaved. Corolla falver-shaped. Filaments attached to the tube. Capsule two-valved.

Sp. 1. *C. cretica*. Linn. Sp. Pl. Mart. 1. Lam. Ill. 183. Willd. 1. (Anthyllis; Alp. Cent. 157. tab. 156. Rai. Hist. 215. Magn. Ch. 212. Quamoclit; Tourn. Cor. 4. Chamæpitys incana, exiguo folio; Bauh. Pin. 249. Lyfimachia spicatae purpure affinis; Pluk. Alm. 236. tab. 43. fig. 6.) "Corollas beardless; capsules with one seed."

A shrub, with a very slender stem, hard and somewhat woody at the base, dividing at the height of one or two inches into a great number of slender ramified branches, which form a close head, five or six inches high. *Leaves* alternate, sessile, very small, numerous, entire, villous, whitish. *Flowers* small, collected into a head at the end of each branch. La Marek suspects that there are naturally two seeds in each capsule, one of them constantly abortive. A native of salt marshes in the island of Candia, the south of France, and Italy. 2. *C. indica*. Mart. 2. Willd. 2. Retz. Obf. 4. 24. "Tips of the corollas bearded; capsules with four seeds." *Flowers* snow-white. It differs from the preceding only in this respect, and those exemplified in the specific character. A native of salt marshes in the East Indies.

CRESSA, in *Ancient Geography*, a port of Asia Minor, in the Doride. Pliny places it 11 miles from the island of Rhodes.—Also, a town of Asia Minor, in Paphlagonia. Steph. Byz.

CRESSANGES, in *Geography*, a town of France, in the department of the Allier; 10 miles S.W. of Moulins.

CRESSERELLE, in *Ornithology*, the name given by Buffon to the Kestrel; Stannel, or wind-hover of other authors; the *Falco tinnunculus* of Gmelin.

CRESETT, any great light on a beacon, in a light-house, or in a watch-tower.

CRESSEY, or CRESSY, HUGH PAULIN, or SERENUS, in *Biography*, an English Catholic divine, and celebrated writer among the Papists, who regard him as one of their ecclesiastical historians, was born at Wakefield in Yorkshire, in the year 1605. At the grammar-school in that town he received the early part of his education, and when he had laid in a sufficient store of classical literature, he was sent to Oxford. He was then only 14 years of age, but he applied with so much vigour to his studies, that in the year 1626 he was admitted Fellow of Merton college. After he had taken his degrees, he entered orders, became chaplain to lord Wentworth, with whom he continued some years, and, in 1638, he went to Ireland, as chaplain to lord Falkland, who, being raised himself to the office of secretary of state, caused Mr. Cressy to be made canon of Windsor in the year 1642, and also dean of Laughlin, but owing to the distracted state of the existing times, he never derived any profit from either of these preferments. After the death of his patron, who was killed in the battle of Newbury, he found himself almost destitute of the means of subsistence, and accepted the proposal of travelling with Charles Bertie, esq. who was afterwards created earl of Falmouth, a favourite of Charles II.; but who was killed in a naval battle with the Dutch soon after the restoration. He left England in the year 1644, and making the tour of Italy with his pupil, he there embraced the Romish religion, and made a public profession of his faith at Rome in the year 1646. At Paris, where he went shortly after, he published an account of the motives of his conversion, which was highly applauded by the devotees to that form of religion. From this period he began to think of devoting himself to a monastic course of life, from which he was dissuaded, but became a member of the Benedictine college of English monks, when he changed his name from Hugh-Paulin for that of Serenus de Cressy. He remained at this college seven years, during which he published a large work on theology, in two vols. 8vo. About the time of Charles the Second's restoration he was appointed to the mission in England, and upon the sovereign's marriage with Catharine the infant of Portugal, was nominated chaplain to the queen, and resided chiefly at Somerset-house in the Strand. He died at East-Grinstead

Grinstead in the year 1674, whither he had retired from his labours and from the controversies in which he had latterly engaged. Although a zealous advocate for the new system which he had adopted, he maintained the character of an open, candid, and good tempered opponent, and secured the respect and esteem not only of those who belonged to his own communion, but of his Protestant adversaries. His principal work was "The Church History of Britanny, from the beginning of the Norman conquest, under Roman Governors, British Kings, the English-Saxon Heptarchy, the English-Saxon, and Danish Monarchy, &c." in folio. The author had intended to have published another volume of this history, bringing it down to the dissolution of the monasteries by king Henry VIII. but his death already noticed prevented the accomplishment of his design. *Biog. Brit.*

CRESSY, in *Geography*. See CRECY.

CREST, in *Armoury*, the uppermost part of the defensive armour of the head; rising over the rest, in manner of the comb or tuft of a cock; to sustain the effort of very keen scimitars, &c. It has its name from *crisla*, *cock's comb*. It likewise denotes a tuft or plume of feathers on a helmet. Anciently those *aigrettes*, which the cavalry wore of a greater height than the infantry, were regarded as objects of luxury and ornament, and of terror to the army. They were originally of horse-hair. Herodotus ascribes the invention of them to the Ethiopians. They still use plumes of bird's feathers, and prefer those of a red colour, on account of its resemblance to that of blood. Sometimes the ancients put three on one helmet to distinguish perhaps different ranks or degrees, as the Turks use double and triple tails.

CREST, CUP, *Crete*, Fr. in *Fortification*, is employed to denote the earth thrown out of a ditch, trench, &c. It is also made use of to express the most elevated part of a parapet or glacis.

CREST, LE, in *Geography*, a town of France, in the department of the Drôme, situated on this river, which divides it north and south, 18 miles S.E. of Valence, 15 N. of Orange, 48 S. by E. of Grenoble, and 432 miles S. by E. of Paris. Its whole population comprises 4500 individuals, but each part of the town is the chief place of a canton, in the district of Die; the northern contains 3800, and its canton 11,307 inhabitants, dispersed in 16 communes, upon a territorial extent of 285 kilometres; the southern contains only 700, and its canton 7081 inhabitants in 12 communes, and upon an extent of 222 kilometres and a half.—Also, a commune in the department of the Puy-de-Dôme, 12 miles S. of Clermont.

CREST, a town of France, in the department of the Puy-de-Dôme, 2 leagues S. E. of Clermont-Ferrand.

CREST, in *Heraldry*, denotes the uppermost part of an armoury; or that part rising over the casq, or helmet.

NEXT to the mantle, says Guillim, the crest or *cognizance* claims the highest place, being seated on the most eminent part of the helmet; yet so, as to admit an interposition of some escrol, wreath, chapeau, crown, &c.

The ancient warriors wore crests to strike terror in their enemies, as the sight of the spoils of animals they had killed; or to give them the more formidable mien, by making them appear taller, &c.

In the ancient tournaments, the cavaliers had plumes of feathers, especially those of ostriches and herons, for their crests; these tufts they called *plumarts*; and they were placed in tubes, on the tops of high caps, or bonnets. Some had their crests of leather; others of parchment, pasteboard, &c. painted or varnished, to keep out the weather; others

of steel, wood, &c. on which were sometimes represented a member or ordinary of the coat; as, an eagle, fleur-de-lis, &c. but never any of those called honourable ordinaries, as pale, fesse, &c. The crests were changeable at pleasure; being reputed no other than as an arbitrary device, or ornament.

Herodotus attributes the rise of crests to the Carians, who first bore feathers on their casqs, and painted figures on their bucklers: whence the Persians called them *cocks*.

The crest is esteemed a greater mark of nobility than the armoury, as being born at Tournaments; to which none were admitted, till they had given proof of their nobility. Sometimes it serves to distinguish the several branches of a family. It has also served, on occasion, as the distinguishing badge of factions. Sometimes the crest is taken from the device; but more usually it is formed of some piece of the arms: thus, the emperor's crest is an eagle; that of Castile, a castle, &c. Families that exchange arms, as the houses of Brunswick and Cologne have done, do not change their crests; the first still retain the horse, and the latter the mermaid.

The crest of the arms of England is a lion passant guardant, crowned with an imperial crown; that of France, a fleur-de-lis.

CREST, among *Carvers*, an imagery, or carved work, to adorn the head, or top, of any thing: like our modern corniche.

CRESTED, in *Heraldry*, is a term applied to a cock, or other bird, whose crest is of a different tincture from other parts.

CRESTED *grass*. See GRASS.

CRESTED *stalk*. See STALK.

CREST-FALLEN, is spoken of a horse, when the upper part of the neck, on which the mane grows, does not stand upright, but hangs either to one side or the other.

CRESTI, DOMENICO, in *Biography*. See DA PASSIGNANO.

CRESTON, or CRESTONO, in *Ancient Geography*, a town of Thrace, and probably the capital of Crestonia, a province of that country.

CRETA, in *Natural History*, and in *Medicine*. See CHALK.

CRETE, in *Ancient Geography*, now called *Candia* from its capital, but known in very ancient times by the names of Aeria, Chthonia, Idæa, Curete, and Macaris, is one of the largest islands in the Mediterranean; and lies between the Archipelago to the north, the African sea to the south, the Carpathian to the east, and the Ionian to the west. Its name Crete is derived by some from the Curetes, who are said to have been its first inhabitants, by others from the nymph Crete, daughter of Hesperus, and by others from Cretus, the son of Jupiter, who is supposed to have reigned here. This island, in remote ages, was celebrated for its fertility; it abounded in all sorts of grain, as its plains were covered with a deep rich soil, and it was plentifully watered by small rivers. The fruits, according to Pliny's account, were much superior to those of any other countries; and its wines have been universally commended. The air was anciently deemed very pure and salubrious, and still retains the same property, though under the Mahometan yoke great part of the country lies uncultivated. From the fruitfulness of its soil, and the purity of its air, it obtained the appellation of Macaris, or the fortunate island. In former times 100 cities were reckoned in this island, 90 before the Trojan war, and 10 more after the Dorians settled here;

here; whence sprung the name of Hecatompolis. Of these 100 cities 40 remained in the time of Ptolemy, for he enumerates so many. The most noted of these were Gnofus, Cydonia, Gortyna, Lycus, Hierapytna, Eleuthera, Rithymna, now Retimo, Héraclea, Præfos, Opteron, and Arcadia. The principal mountain of this island is Ida, and next to this are Diète and Leuci. Its rivers are few and inconsiderable; but this defect is supplied by many creeks and bays, and some capacious and safe harbours. The labyrinth of Dædalus near mount Ida has been recorded among its ancient curiosities, but no traces of it were discoverable in the time of Pliny. The first inhabitants of Crete were, according to Diodorus Siculus, the Idæi Dactyli, 100 in number, who inhabited mount Ida. (See DACTYLI *Idæi*.) Next to these were the 9 Curetes. (See CURETES.) Contemporary with these were the *Titans*, which see. According to several ancient authors, the Curetes and Idæi Dactyli were the same people, and did not settle in Crete till the time of Minos. Bochart supposes, from a similarity between the appellation Curetes and that of Cerethites, a tribe among the Philistines, that they came from Palestine. But long before they settled in Crete a colony of Pelasgians had peopled the eastern coast of the island. After them, Teutamus, the grandfather of Minos, brought thither a colony of Dorians from Laconia, and the territory of Olympia, in Peloponnesus. These inhabitants occupied caves and huts, and subsisted on the spontaneous productions of the earth; but were at last reduced into one kingdom in the reign of Minos, who was their first law-giver, built many towns, and introduced the arts of ploughing and sowing. In the reign of Minos, Rhadamanthus his brother transported several colonies into the neighbouring islands, which he bestowed upon the commanders of his army. The Trojans, as the most ancient writers have said, were Cretans. The government of the Cretans was at first monarchical. The first king, who reigned in Crete, was, according to Eusebius, Cres or Cretes, of whom we have many discordant and fabulous accounts. In the list of sovereigns we find that Strabo and Pausanias distinguish two under the name of Rhadamanthus, and two under that of Minos. The famous Rhadamanthus, who, according to the poets, was judge of the infernal regions, was brother to Minos II. Minos, the famous law-giver of Crete, was the first of the Grecians who equipped a fleet, and gained the dominion of the sea; the father of Deucalion the Argonaut, and also of Androgeus, who was privately murdered by Ægeus king of Athens; in consequence of which outrage Minos denounced war against the Athenians. But finding all attempts to revenge the death of his son unsuccessful, he made his appeal to the gods, who are said to have afflicted the Athenians with pestilence and famine; upon which they consulted the oracle of Delphi, and were informed that they must not expect any relief, till they were reconciled to Minos. The Cretan king, as the condition of their deliverance, imposed upon them a yearly tribute of 7 boys and 7 girls, whom he condemned to be devoured by the Minotaur, during the space of 7 or 9 years. Minos, having for 3 succeeding years exacted this sanguinary tribute, Theseus, who had performed many glorious exploits, voluntarily offered himself to be one of the unhappy victims; and accordingly, sailing with his devoted companions to Crete, he there killed the Minotaur, and rescued his country from the bloody Cretan tribute. Minos was, according to Plato and Aristotle, the institutor of those laws, which they have highly commended. He first banished idleness and luxury from his dominions; and finding means of employment for all his subjects, either at home or abroad, he would not suffer any of them, what-

ever might be their rank, to lead an indolent life; but obliged them either to serve in the army, or apply to agriculture, which he raised into great reputation. In order to establish a kind of equality among his subjects, he decreed, that in each city the children should be educated together, in the same maxims, exercises, and arts; that they should be accustomed to bear hunger and thirst, heat and cold; to ensure themselves to labour and difficulty; to skirmish with each other in small parties, and to exercise themselves in a kind of dance with their armour, which was afterwards called the Pyrrhic. They were also accustomed to the use of the bow, in which they excelled. The poor and rich took their repasts together, and subsisted on the same diet; and the expence of their meals was defrayed by the public; one part of the revenues of the state being applied to the purposes of religion, and the salaries of the magistrates, and the rest allotted for the public feasts. After their repast, the old men discoursed of the actions and virtues of their ancestors, and of such as had distinguished themselves, either by their valour in war, or their wisdom in peace; and the youth, who were present at these entertainments, were exhorted to propose these great persons to themselves, as models for the forming of their manners, and for the regulation of their conduct. Another of the institutions of Minos, which Plato admires the most, was to inspire the youth sometimes with a high respect for the maxims, customs, and laws of their own country. He would not suffer them to question the wisdom of their constitution; but commanded them to consider the laws as dictated by the gods themselves. He paid the same regard to the magistrates and aged persons, whom he enjoined every one to treat with respect and honour: and that nothing might lessen the reverence due to age, he ordained, that if any defects were observed in them, they should never be mentioned in the presence of the youth. Slaves were also better treated at Crete than any where else; for here it was a custom, on occasion of the feasts of Mercury, for the masters to wait on their slaves at table, and to perform the same offices which they received from them during the rest of the year. This custom was designed to remind men of the primitive state of the world, in which all men were equal; and to signify to the masters, that their servants were of the same nature with themselves. The laws of Minos were anciently in such repute, that Lycurgus passed a considerable time in Crete, in order to study the Cretan constitution, that he might form his laws upon the model of those which then obtained in the island. Plato tells us, that Crete, under the government of so wise a prince, became the abode of virtue, probity, and justice; and that the laws which he established were so well founded in justice and equity, that they subsisted in their full vigour even in his time, that is, above 900 years after they had been first published. It is true, the Cretans afterwards degenerated from their ancient probity; and at length, by an entire change of manners, became the most vicious nation that was known either to the Greeks or Latins. Polybius (l. vi.) asserts, that the Cretans in his time were avaricious and selfish to such a degree, as to think no lucre forbid. Suidas and Callimachus (Hymn. in Jov. v. 8.) give them the character of liars and impostors; and justify the character given of them by St. Paul, on the testimony of one of their own poets, probably Epimenides, who paints them in very disgraceful colours. The impurity of their amours is too well known from the accounts given of them by Strabo (l. x.), Servius (*Æn.* l. x. v. 325.), and Athenæus (*Deipn.* l. xiii., &c.) Nevertheless, this change of manners does not affect the probity of the ancient Cretans, nor lessen the glory of their legislator. We cannot forbear mentioning, however,

however, that whilst by his institutions every citizen was obliged to marry, he contrived to prevent their having too many children by very unwarrantable means. Whether in Crete the fertility or extent of the lands did not correspond to the number of the inhabitants, or that the men were more robust, and the women more fruitful, Minos authorized, by his laws, a passion which nature disfavours, and permitted an excess which modesty can never make without horror. (See *Arist.* l. ii. c. 20. *Strabo*, l. x. *Athen.* l. xiii.)

We learn from *Suidas*, that the race of Minos possessed the sovereignty of Crete, till the abolition of a monarchical government. Upon the introduction of a republican form, the chief power was vested in the senate, composed of 30 members, called by *Aristotle* (*De Republ.* l. ii. c. 10.) the public council of the nation. The resolutions of this body, however, were of no force till the people had confirmed them by their suffrages. Next in authority to the senate were the "cosmi," magistrates, as their name imports, appointed for the maintaining of good order (*κοσμοι*) in the state. They were 10 in number, and resembled the Spartan ephori; they were chosen out of the whole body of the people, and were intended as a balance between the people and the senate, and a check upon both; for, without their approbation, no decree had any validity. They commanded the armies of the republic with absolute power, but were liable to be called to account; whereas the senators were not responsible for their administration. Out of this body the senators were chosen. In this condition the island of Crete continued for many years. But it was occasionally distracted by civil contests. In the time of Philip, the father of Perseus, the Gossians and Gortynians had reduced all the other cities of the island, and divided their conquests; so that the Cretans were no longer free, but subject to one of these cities, and obliged to acknowledge their subjection by an annual tribute. (*Polyb.* l. iv.) By these internal commotions the Cretans became skilled in the arts of war; and their reputation in this respect was so general among other nations, that most states and princes always maintained in their armies some bodies of Cretan bowmen and slingers; the Cretans having been, in all ages, as *Pausanias* observes (in *Attic.*), remarkable for their dexterity and experience in the use of the sling and bow. *Xenophon* informs us (*lib.* iv.) that they were of great service in the retreat of the 10,000. And if we credit *Arrian* (*De Exped. Alex.*), many of Alexander's victories were owing to the Cretan auxiliaries. *Livy* also mentions (*lib.* xxxvii. c. 41. *lib.* xxxviii. c. 21.) the advantages which the Romans derived from the archers and slingers of Crete, in the famous battle fought near mount Olympus. After the Romans became acquainted with Crete, they employed the inhabitants in all their expeditions, keeping constantly in their pay a numerous body of Cretan auxiliaries, who, in general, distinguished themselves by their gallantry. (*Livy*, *ubi supra.*) However, notwithstanding the alliance formed between them and the Romans, the Cretans entered into measures with other potentates, without consulting the Roman senate. This conduct furnished the Romans (B. C. 68.) with a specious pretext for enslaving an island, which, till that time, had been free from all foreign subjection. The Romans had formed a purpose of conquering Crete; and finding or feigning an occasion of quarrel, they employed means for this purpose. The Cretans endeavoured to conciliate their enemies; but their ambassadors returned from Rome without succeeding in their embassy. The conditions imposed upon them were so humiliating, that they chose rather to hazard a war, than to enjoy peace upon such terms. As soon as the ambassadors were dismissed, *Metellus* embarked with three legions, and arriving on the

coast of Crete, landed without opposition. Such was the progress of his arms, that the inhabitants of the island were compelled to submit to the Roman yoke (B. C. 66.) *Metellus* changed their form of government; obliged them to live according to the laws of Rome; imposed an annual tribute upon the whole island; and reduced it to a Roman province, after it had enjoyed its liberties for a series of ages. According to *Velleius Paterculus*, *Eutropius*, and other historians, the Romans spent three whole years in this work of subjugation, having to encounter with men no less brave than themselves. *Metellus* was honoured with a triumph, and the surname of *Creticus* or the *Cretan*, so important did the Romans deem this conquest. For the subsequent history and present state of this island, see *CANDIA*.

CRETE, *Sea of*, or *Cretan sea*, is properly that part of the *Ægean sea*, or *Archipelago*, which lies about Crete, and which contained the islands of *Claude*, *Dia*, *Letoa*, *Ægilia*, *Calymna*, *Αίτυπαῖα*, *Thera*, &c.

CRETEA, a country of the *Peloponnesus*, in *Arcadia*, where, and not in Crete, according to *Pausanias*, *Jupiter* was brought up.

CRETHOTE, a town of the *Thracian Chersonesus*, on the borders of the *Propontide*.

CRETI, **DONATO**, in *Biography*, a painter, who was born at *Cremona*, in 1671, and educated at *Bologna*, in the school of *Lorenzo Passinelli*; but, although he is considered one of the best disciples of that master, his style partakes more of that of *Simone da Pesaro*, whose beautiful etchings were the admiration of *Creti*. By studying these, he acquired that delicacy and facility of drawing with the pen, which have rendered his sketches so generally and so deservedly esteemed. As a painter, he is little known out of *Bologna*; but some of his pictures there exist, particularly an altar piece in the church of the *Padri Predicatori*, and the *Fest of Alexander*, in the *Palazzo Fava*, which possess great merit, although the colouring of them is somewhat crude and disagreeable. *Donato* died in 1749. *Lanzi*. *Orlandi*.

CRETIC, **CRETICUS**, in *Prosody*, a trisyllabic foot, consisting of one short syllable between two long ones; as in the words *ἰσχυρῶν*, *quōvō nūc*.

CRETIN, **GUILLAUME DUBOIS**, **DIT**, in *Biography*, an old French poet, was a native of *Lyons*, and died in the year 1525. He was historiographer to the king, under the reign of *Charles VIII.*, *Louis XII.*, and *Francis I.* of *France*. His works were reprinted at *Paris* in 1724. They are full of puns, conundrums, and equivocal expressions, as has justly been observed by *Rabelais* in his *Pantagruel*, where *Cretin* is designed by the name of old *Rominagrobis*. *Nouv. Dictionnaire Historique*.

CRETINS, is the name given in the republic of *Valais* in *Switzerland*, and in the department of *Mont Blanc* in *France*, formerly the duchy of *Savoy*, to helpless idiots, whose organization is so incomplete, that the most pressing wants of life scarcely draw from them any symptoms of sensation. They generally lie on couches, or on the ground, like senseless brutes. Sometimes, says *Mr. Coxe*, in his "Travels through *Switzerland*," they are seen basking in the sun, with staring eyes, open mouths, their tongues half out, and their heads hanging down, exhibiting the most affecting spectacle of intellectual imbecility that can possibly be conceived. *Mr. J. G. Le Maitre*, in his travels after the peace of *Amiens*, saw, at *Martigny* in the *Valais*, innumerable idiots with distorted forms, "grinning horribly a ghastly smile" in almost every window.

According to the author of the "*Recherches sur les Américains*," *Cretins* are deaf, mute, and almost insensible to blows; but they are neither furious nor malevolent; they have

have no other stimulus than their physical wants, are never contradicted or insulted by children, and are approached with veneration by old people.

Every humane attention is paid to these miserable objects, be their parents ever so poor. A fortunate prejudice preserves their excellence. The inhabitants of the countries where they are found imagine that it is a mark of divine favour to have an idiot of this kind born in their family. They esteem them "Blessings from Heaven," and call them "Souls of God without Sin;" because, as they are incapable of intentional criminality, they consider them as certain of happiness in a future state. Instead of neglecting these unhappy mortals, they treat them with the most affectionate kindness, and deprive themselves of common necessities in order to afford all the conveniences of life to these supposed favourites of heaven.

Mr. Coxe says, that these idiots are suffered to marry, as well among themselves as with others. However, Mr. F. J. Durand, in his "Statistique Elémentaire de la Suisse," published at Lausanne in 1795, assures us that they do not perpetuate their race. Their organization is incomplete from their birth, and often in a family of five or six children there is but one cretin. This monstrosity, therefore, cannot, as it has been asserted, arise from the disgusting filthiness of the parents, for the want of cleanliness in the inhabitants of those countries has been greatly exaggerated; and there are cretins in families of the utmost cleanliness and of the first opulence. Nor can it be owing to their physical education; for the idiots from the cradle are fed and brought up like their brothers and sisters, who labour under no intellectual imbecility. Neither can it be attributed to the excessive heat of the valleys, or to the unwholesomeness of the water, since these causes would operate equally on all the inhabitants.

These remarks are amply confirmed by the learned Ramond, in his "Observations sur les Pyrénées." He affirms, that the idiots of the Valais are inferior both in number and imbecility to those of the valley of Luchen, and other valleys in the Pyrenées. "On observing this sad conformity," says he, "who would not suppose that the causes of this degradation must be the same?" And yet the cretins of the Valais are found towards the south in confined valleys, on a moist soil, and having none but stagnant water; whilst, in the Pyrenées, they are mostly in spacious valleys to the north, in an open country, in a dry and temperate atmosphere, and surrounded by pure and limpid springs.

Besides, these idiots are not absolutely confined to the Alps and Pyrenées; they are also met with in other countries, yet not so frequently. Sir George Staunton informs us, in his "Embassy to China," that he found traces of cretinage in a very mountainous district of that country. Some years ago there was at Hull, a female cretin of the name of Southern, and another at Plymouth, a boy, son to Mr. Cowley, the inn-keeper. All that can be affirmed with truth is, that idiots are more abundant in some districts of the Valais, than perhaps in any other part of the globe.

A physician of Lyons, happening to be at Sion, the capital of the Valais, three days after the death of a cretin, solicited, in vain, permission to open the body, although the causes of this extraordinary appearance have not yet been satisfactorily explained. The abbé Richard, in his "Voyage d'Italie," has published several ingenious conjectures on this subject under the article SAVOYE. M. de Saussure ascribes this disorder to the concentrated heat and stagnant air; but for further particulars we refer to the article

GOITRE.

CRETIO, in *Antiquity*, a certain number of days allowed

the heir to consider whether he would act as heir to the deceased or not; after which time if he did not act, he was excluded from the estate.

CRETOPOLIS, in *Ancient Geography*, a town of Asia, in Carabala, a country of Pamphylia.

CREVACORE, in *Geography*, a small town of France, in the department of Sefia, which formerly constituted part of Piedmont in Italy. It is the chief place of a canton, in the district of Vercell. The town contains 919, and the canton 6792 inhabitants, dispersed in 18 communes. Before the revolution it was styled a marquissate, and had a very fine castle.

CREVALCORE, DA, ANTONIO, in *Biography*, a painter, whose family name was Leonelli, but who was called da Crevalcore, from the place of his birth, a town in the Bolognese state. This artist flourished at Bologna in the year 1490, and distinguished himself as a portrait painter. He also represented, with success, fruits, flowers, and animals, and was besides a celebrated musician. Orlandi.

CREVALCORE, DA, PIETRO MARIA, the scholar of Dionigio Calvaert, designed and painted with great bravura at Bologna. His pictures shew that he studied the works of the Caracci with some advantage. He flourished in the year 1580. Lanzi.

CREVASTA, in *Geography*, a town of European Turkey, in the province of Albania; 36 miles S.S.E. of Durazzo.—Also, a river of European Turkey, which runs into the Adriatic, 8 miles S. of Joannina, in the province of Albania.

CREVECOEUR, a small town of France, in the department of the Oise; 15 miles N. of Beauvais, which, before the revolution, conferred the title of marquis on the lords of the manor. It is the chief place of a canton, in the district of Clermont, and has some manufactures of woollen cloth. The town contains 2013, and the canton 11,207 inhabitants, in 20 communes, upon a territorial extent of 155 kilometres.

CREVECOEUR, a Dutch fort and factory in Africa at Acra, on the Gold Coast, situated within cannon-shot of the English fort James, on the extremity of a high rock; the beach for landing being under the fire of the artillery and musketry of the fort. It is a square building, flanked with batteries joined by long curtains, of such irregular construction that it cannot withstand a long attack.

CREVELT, a town of France, in the department of the Roer, which formerly constituted a part of the duchy of Juliers, in Westphalia. It is the chief place of a district, and very neatly built. It has a sub-prefect, a court of justice, a regiller-office, and 7443 inhabitants; several of whom are Memnonites, and whose manufactures of woollen and linen cloth, silk, velvet, ribbands, soap, and tobacco, are exceedingly flourishing. The district has besides excellent pastures, is famous for its good butter, and abounds with all sorts of corn, hemp, and flax. It contains 11 cantons, 192 communes, and 137,215 inhabitants, upon an extent of 1375 kilometres.

CREVIC, a town of France, in the department of the Meurthe, and district of Luneville; 1½ league N.W. of Luneville.

CREVIER, JOHN BAPTIST LEWIS, in *Biography*, was born at Paris in 1693, studied under the celebrated Rollin, was professor of rhetoric at the college of Beauvais; and, after the death of his master, completed his unfinished Roman History in 8 volumes. He also edited Livy, with notes, in 4to., wrote the History of the Roman Emperors, in 6 vols. in 4to., the History of the University of Paris, in 7 vols. 12mo., and a French Rhetoric, in 2 vols. 12mo., which has been reprinted at Liege in 1787. All his

works breathe the purest attachment to the cause of religion and virtue. His style, however, is inferior to that of Rollin. He died at Paris on the 11th of December, 1765, in his 74th year. His observations on Montesquieu's *Esprit des Loix* have sunk into merited oblivion. *Nouv. Dict. Historique.*

CREULLY, in *Geography*, a small town of France, in the department of Calvados; 12 miles N.W. of Caen, and 6 miles E. of Bayeux. It is the chief place of a canton, in the district of Caen, and has a population of 1060 individuals. The canton itself contains 31 communes, and 14,059 inhabitants, upon a territorial extent of 127 kilometres and a half.

CREUS, or CRUZ, *Cape*, a cape of Spain, on the coast of Catalonia in the Mediterranean. N. lat. 42° 29'. Long 19° 53' E. of the peak of Teneriffe.

CREUSE, a river of France, which gives its name to one of the nine central departments. It has its source in the south, in the mountains which border the department of Correze, flows to the north, and, passing by Aubusson, Argenton, Le Blanc, La Roche Pofay, and La Guerche, it throws itself into the river Vienne, below La Haye, at a place called *Le Bec des Eaux*. It takes up the Little Creuse and the Gartempe. The Creuse is navigable only in some places: its course is about 230 kilometres.

CREUSE, *the Department of the*, is the seventh central department of France. Its capital is Guéret. It consists of the province formerly called La Marche, and owes its name to the river Creuse.

To the northwest this department is bounded by that of the Indre; to the north-east by that of the Alier; to the east by that of the Puy-de-Dôme; to the south by that of the Correze; and to the west by that of the Upper Vienne. Its principal rivers are the Creuse, the Little Creuse, the Tardes, Thorion, Ardour, and Gartempe.

The climate is serene and salubrious, but rather cold. The soil is not favourable to wheat, but it produces rye, oats, garden-fruits, and the vine. There are good pastures for horses, cattle, and sheep; coal mines, marble quarries, and mineral springs. The principal trade is in cattle, wool, and cheese.

The department of the Creuse has some capital manufactures of tapestry, coarse woollens, and linen cloth. Its territorial extent is 5794 square kilometres and a half. The number of inhabitants amounts to 216,255, or 751 individuals to the square league. The average contribution of each individual annually is about 4s. 3d. sterling.

Besides the capital, Guéret, the principal towns are Aubusson, Bonnat, Evaux, Felletin, Bourgueuil, and Bouffac.

CREUSIS, in *Ancient Geography*, a maritime town of Bœotia, situated in the gulf of Corinth. It was the arsenal of the Thespians. *Pausanias*, l. ix. Bœotia, c. 32.

CREUSSEN, in *Geography*, a small town of Franconia, in Germany, 9 miles W. of Egra, with a flourishing manufacture of earthenware. It is also called *Crusen*, in Latin *Crusina*, and belonged to the king of Prussia as margrave of Anspach.

CREUTZBERG, or CREUTZBURG, a small town of Prussia, in the duchy of Silesia, on the little river Brinnitz, in the principality of Brieg, 39 miles E. of Brieg, famous for its very brisk trade in honey, bees' wax, leather, and linen cloth. Also, a small town of Saxony, in the principality of Saxe-Edenach, situated on the river Werra, over which there is a handsome stone bridge. The place contains 320 houses and about 1600 inhabitants, whose chief industry consists in agriculture.—Also, a small town of

Prussia, in the circle of Natangen in East Prussia, with an old ruined castle.

CREUTZFELDER, JOHAN GEORG, in *Biography*, a portrait painter, who died at Nuremberg in 1633. We have, amongst many others, the following portraits engraved after this artist: Gottlieb, count of Oettingen, a small plate, by L. Kilian; Philip Gottlieb, count of Hohenloe, a large oval ditto by Haunzelman. Heineken.

CREUTZNACH, in Latin *Cruciniacum*, in *Geography*, a small town of France, in the department of Rhine and Moselle, on the river Nahe, 24 miles S.W. of Mayence. It is the chief place of a canton, in the district of Simmern, and has 3187 inhabitants. The canton contains 17 communes, and a population of 9265 individuals. The salt-springs near Creutznach are very important, and produce annually to the value of from 220 to 230,000 French livres to the public revenue.

CREUTZOFF, a town of the duchy of Courland; 16 miles S.S.W. of Mittau.

CREUX, a term in *Sculpture*, much used by the French; though not yet, that we know of, naturalized among us; but the want of a word of equal import in English, as it has frequently put us under a necessity of using this in the course of the present work; so it pleads strongly for its admission into our language.

Creux originally signifies a hollow, cavity, or pit, out of which something has been scooped, or dug: hence it is used to denote that kind of sculpture, and graving, where the lines and figures are cut and formed within the face, or plane of the plate, or matter engraven on.

In which sense, it stands opposed to *relievo*; where the lines and figures are embossed, and appear prominent above the face of the matter.

CREUZBURG, in *Geography*, a town of Bohemia, in the circle of Czailau; 10 miles N.E. of Teutsch-Brod.

CREW, the company of sailors belonging to a ship, boat, or other vessel.

The sailors that are to work and manage a ship are regulated by the number of lasts it may carry; each last making two tun.

The crew of a Dutch ship, from 40 to 50 lasts, is seven sailors and a swabber; from 50 to 60 lasts, the crew consists of eight men and swabber; and thus increases at the rate of one man for every ten lasts; so that a ship of 100 lasts has twelve men, &c. English and French crews are usually stronger than Dutch; but always in about the same proportion.

In a ship of war there are several particular crews, or gangs, as the boatswain's crew, the carpenter's crew, the gunner's crew, &c.

CREW, NATHANIEL, in *Biography*, an English prelate who flourished in the seventeenth and eighteenth centuries, was born in 1633, and was the fifth son of lord Crew. In the year 1652 he was admitted commoner of Lincoln college in Oxford, where he took his degree in February 1655-6, and shortly after was chosen fellow of that college. At the restoration of Charles II. he became a zealous adherent of the royal cause, and was soon made one of the professors of the university. In the following year he took the degree of doctor of laws, and then went into holy orders. He was elected rector of Lincoln college, and in the following April he was installed dean of Chichester, with which he held the precentorship. He became a favourite of the king, and was appointed clerk of the closet, and in 1671 was raised to the see of Oxford. He had held this situation but three years, when he was elected to the more important bishopric of Durham, which was given him in

consequence of some services rendered by him to the duke of York, to whose measures he seems to have been but too subservient. In 1676 he was admitted to the rank of privy-counsellor; and on the accession of James II. to the throne, he obtained the appointment of dean of the chapel-royal in the room of Dr. Compton, bishop of London, who was rendered unfit by his honest and zealous opposition to popery. The principles of bishop Crew seem never to have stood in his way of preferment; he could change with the times, and join in any acts that his superiors might deem fit to be performed. He was accordingly selected as one of the ecclesiastical commissioners to carry into effect the determinations of James, which finally cost the ill-fated sovereign his crown. In this commission Crew was the abettor of many of the cruel projects which disgraced that age. He took an active part in the suspension of the bishop of London, and in the persecutions inflicted upon Mr. Samuel Johnson, an eminent divine; and he countenanced by his presence another prosecution carried on against Dr. Peachy. In the same year he offered to attend the pope's nuncio at his public entry into London, but it is said his coachman refused to drive him that way. He proceeded on in this course without any remorse, or apparent anxiety, till he found the prince of Orange's party likely to prevail; he then began to contrive means for escaping the punishment due to his misdeeds. When William ascended the throne, the name of Crew was omitted in the pardon granted to those who had been active for the fallen monarch. The bishop absconded, and offered to resign his office if he might be allowed a thousand a-year during life. By the intercession of Dr. Tillotson he was permitted to make his peace, and retain his dignity on very easy terms. In 1691 he succeeded to the title and estates of his late father, owing to the death of the last of his elder brothers, and from this time he passed through life without much notice, and spent his time in works of munificence, hospitality, and charity. He died in September, 1721, aged 88, having held the see of Durham 47 years, and his office as bishop full half a century, which, with the exception of Bourne, archbishop of Canterbury, was a longer period than any Englishman had ever enjoyed that distinguished honour. His lordship died without issue; nor did he leave any works as a literary character to render his name illustrious, and his conduct as a man and a courtier have no claim to the gratitude of posterity. They deserve, however, notice, in order that others may be deterred from acting so inglorious a part when temptations to wealth or to worldly honour are held out to draw them from the line of duty and strict integrity. Biog. Brit.

CREWKERNE, in *Geography*, a market town in Somersetshire, England, consists of five streets, and is situated in a pleasant well-wooded valley, remarkable for the salubrity of the air and the high cultivation of the surrounding lands. The Saxon name was *Crucerne*, derived, according to some topographers, from *Cruce*, a cross, and *Carne*, a cottage. Leland mentions his having seen the former when at Crewkerne, and describes it as then environed by small pillars. The church, with a body and transepts, and a handsome embattled tower, supported by masonry pillars, deserves the antiquary's attention, as it is decorated with many curious sculptures and has a confessional behind the altar. The door of entrance on one side is surmounted by the representation of two swine, intended as emblematic of the polluted soul of the penitent previous to confession and absolution, the purity conferred by which is denoted in the figures of two angels over another door. There are two almshouses, a large charity school endowed by Dr. Hody,

a free grammar school, a work-house, and a handsome town-house, though greatly out of repair. It has some manufactures of dowlas, sail-cloth, girt-web, and ilockings. By the return of the population act, 41 Geo. III., the number of inhabitants was 489, and of persons 2576, of whom 1154 are males and 1422 females, 406 employed in agriculture, and 551 in trade, manufactures, or handicraft. The market on Saturdays is well supplied with provisions and corn, and here is an annual fair in September. Crewkerne is 131½ miles W.S.W. of London. Collinson's History of Somersetshire, 3 vols. 4to.

CREX, in *Ornithology*, the daker-hen or rail of Ray, Willughby, and Albinus, the crane-gallinule of Pennant and Latham, and rallas with red-ferruginous wings of Linnaeus and Gmelin. See RALLUS *Crex*.

CREX is also the name given by Bellonius, Aldrovand, Willughby, and Ray, to the spotted red-shank of Pennant or spotted snipe of Latham, the *SCOLOPAX totanus* of Gmelin, which see.

CREXA, in *Ancient Geography*, an island of the Adriatic sea, on the coast of Illyria, according to Pliny; called by Ptolemy *Crepia*, and now Cherfo.

CRIB, in the English *Salt-Works*, the name given to a sort of case used in some places instead of the drab, to put the salt into as it is taken out of the boiling pan.

These cribs are like hay-racks, wide at the top, and tapering to a narrow bottom, with wooden tops on each side, placed so close, that the salt cannot easily fall through them. Through these apertures, however, the superfluous saline liquor drains out, and leaves the salt, after a few days, dry enough to be added to the heaps that stand ready for sale. At Lymington, and in some other places, they use, instead of these cribs, a sort of wooden troughs with holes in the bottom, through which the saline liquor drains from the salt, and falls into vessels placed underneath to receive it; and in other places they use barrows or wicker baskets, out of which the liquor runs with great ease on all sides at once.

CRIB-biting, a vice of horses; this term is of purely English origin, which is not frequent with the terms used in the management or diseases of the horse, which are for the most part French or Latin strangely corrupted.

The crib denotes, in more modern phrase, the manger, from *manger*, French, to eat; the crib being left for the fodder of the cows, to which the name is at present exclusively applied; the original crib, since oats have been introduced, being fixed to the wall of the stable for the horse, has obtained the name of *rack*, so that the term crib-biting to some would appear improper, to others too antique, or entirely obsolete. The crib-biting horse has generally a lean constricted appearance, the skin being contracted about the ribs, a sunken watery eye, or else too dry; the muscles of the face also, as well as the skin, drawn up with rigidity; when unemployed in eating, his almost constant amusement is to grasp the rail of the manger with his front teeth, then to draw himself up to it as to a fixed point, by a general contraction of all the muscles of the head, neck, and trunk: at the same time the effort is attended with a grunting sound, apparently from air expelled by the mouth; a relaxation succeeds, and then a new effort, flaving the manger very much with the tongue, as the mouth being held open, the saliva naturally takes this direction.

The horse that has contracted this unsightly habit grows lean, his digestion is sometimes impaired, and it is generally conceived he draws a r into his stomach, which is the cause of this; his temper becomes soured, and more or less weakness and unsuitness for service ensue, according to his natural strength;

strength; for some do not appear materially in this respect to be injured by it; while others are obviously rendered much weaker by it, and more incapable of a proper day's work; it appears indeed that horses of a fiery, hot, and unkind temper get the most easily into this vice.

How this extraordinary propensity is first created, has not been, we believe, much attended to; with some it appears to arise naturally, as though the sucking of air gave them pleasure, or a relief from some sort of suffering: at first we imagined pains of the stomach from acidity, or other causes might create it, as horses eat dirt, or gnaw the walls, to alleviate unpleasant feelings of this organ. The bad digestion and foul feeding are probably only a consequence and not a cause of this malady. That horses at all disposed to it may be easily led into it by the practices of the grooms in cleaning them, we have little doubt; if they clean them before the manger, and irritate them with too severe a comb, and in parts where they cannot endure it, they seize upon the manger for a counter action to their sufferings, and in doing this must first get a habit of it, and may extend it to the removing of other pains, or distressful feelings. By this means, especially if the grooms, and some have a happy knack of this, after every bite, put in a blow or stroke of the comb, till they follow each other in regular succession, they create a vice which may or may not continue afterwards, according to the situation and circumstances attending the individual. Some are said to get it by imitation of other horses; whether or not the same practices of the groom applied to several horses in the same stable, should not be rather apprehended to be the cause, we are not assured; in one instance, we think, we observed this satisfactorily enough to be the cause, though it passed for imitation.

To break horses of this vice is difficult; cutting off the end of the tongue has been resorted to by some as a cure for it; the soreness created by this means destroying the inclination to the trick for a time; when the habit once being interrupted, might or might not again return.

Another and more usual way with these horses is to buckle a strap tight about their neck, so tight as to prevent, by the constriction of the throat, the power of doing it, or at any rate, creating sufficient uneasiness to disincline them to it.

In preventing the habit, it appears but reasonable with regard to such horses as are inclined to it, always to turn them from the manger before they are cleaned, with their heads to the heel-posts, or to clean them in the open air, or by other means, to avoid as much as possible irritating those that have preternaturally thin and irritable skins, by too rough an iron comb, and to break through any regular habit of inducing biting after each stroke of the comb, for they learn to do this at first only in the most sensible parts, as the flanks, the inside of the thighs, the belly, &c. and afterwards in every part on the slightest touch of the comb, or even the sight of it. Some horses, it must be admitted, are truly difficult to clean; many also are rendered more so than they need be by inconsiderate rashness, and ill applied severity, to prevent these associations and mischief. Proper precautions cannot be taken too early against a habit of this kind, for once formed, it is not easily afterwards to be subdued, even by great patience and well-judged measures.

In concluding these remarks, we may observe, that in the purchase and sale of horses this vice is not unfrequently a subject of litigation: should we venture to interpose an opinion on the question usually agitated on those occasions, whether a horse be unsound or not, or, in other words, returnable or not with this defect, we should say if the warranty extended to soundness only, the horse is not returnable, as horses are often found with it as to their going; but if vice is stated in the

warranty, the horse is unquestionably returnable, as it may be ranked among the worst of them.

CRIBBAGE, a game at cards, wherein no cards are thrown out, and the set makes sixty-one: it being an advantage to deal, by reason of the crib, it is proper to lift for it; and he who has the least card deals.

CRIBBATH *Lime-works*, in the south-west corner of Brecon county, in South Wales, are the property of Matthew Gwyn, esq. leased to Shearby and Co. who have made a rail-way extension of the line of the Swansea canal, of three-quarters of a mile in length, to reach these quarries, which are situate on the northern edge of the mineral basin or coal district of South Wales. (Phil. Transf. 1806, p. 342.) See SWANSEA CANAL.

CRIBBLE, in *Rural Economy*, a term sometimes employed provincially to signify a coarse sort of meal, which is but very little finer than bran.

CRIBRARIA, in *Botany*, a genus in the class *cryptogamia*, and the order of fungi, formed by Schrader out of the spherocarpi of Bulliard. It has for its essential character a pericarp, the upper part of which has numerous apertures, through which the seeds are ejected in the form of a powder. It contains spherocarpus trichioides, and semi-trichioides of Bulliard, and several other species, all which are found in autumn on rotten wood.

CRIBRATION, in *Pharmacy*, *sifting*; the act of separating the finer parts of a medicine, whether dry or humid, from the grosser; the latter by means of a pulping sieve, the former by a fine sifter.

With respect to cribration, Quincy makes the following remark, in order to obviate the mischiefs and inconveniences which, through inadvertency or haste, frequently happen in the practical shops: which is, that whatsoever is to be powdered, the whole ingredient or ingredients, with all their parts, to be used, should pass the sieve, and be all mixed equally together before any be used. For though neglect of this caution, several medicines which come under this kind of management, will, in their different parts, be of different efficacies, according as that part of most virtue, being more or less friable, may pass through first, which will make that much too strong, or remain behind to the same prejudice. In composition likewise of ingredients of different textures or cohesions, some run through much sooner than others; so that there is an absolute necessity of mixing the whole carefully after all is passed.

CRIBRIFORME, or *Cribrosum os*, in *Anatomy*, appellations which are sometimes given to the ethmoid bone.

CRICELASIA, formed of *κρικος*, ring, and *ελαινω*, I drive, among the Greeks, the exercise of rolling the circle, or trochus. This was a species of exercise in use among the ancients; and is, though not very distinctly, observed by Oribanius, in his Medicinal collections, lib. vi. cap. 26. from Antyllus. It should seem to be little more than driving the hoop, as is now practised by boys. The hoop was so large as to reach as high as the breast of the person who used it: the instrument by which it was driven along was of iron, with a wooden handle; and small rings, *κρικαι*, were fastened to the hoop, to jingle and divert the person who exercised himself with it; which Oribanius considers of importance. This exercise was recommended for rendering the limbs pliable, and strengthening weak nerves.

CRICETUS, in *Zoology*, the name of an animal of the mouse kind; the hamster of Buffon, the German marmot of Pennant, and *Mus Cricetus* of Gmelin, which see.

CRICH, in *Geography*, a vicarage in the hundred of Morleston, in the county of Derby.

The church stands on an eminence, and has a spire of considerable height, which makes it a conspicuous object towards

every quarter but the N.W., in which direction the hill rises, to that high and remarkable isolated mass of lime-stone, on which the round tower or monument was erected some years ago, as a prospect-house. To the geologist, Crich-hill presents one of the most curious and stupendous dislocations of the strata which Derbyshire perhaps any where furnishes; the mineral lime-stone here seen, forming the summit of the hill, is lifted and supported, at not less, perhaps, than 1000 yards above the level of the same stratum surrounding it at a distance on every side. On the N.W. N. and E. sides of the monument-hill or cliff, the lime-stone rock dips in an angle of 30 or 40 degrees, and is soon covered by the shale, grit-stone, and coal-measures, dipping almost equally fast. The town stands upon a considerable tract of the elevated lime-stone, lying nearly in an horizontal position, a fissure passing on its S.W. side, across which we pass in going towards Wirksworth, at once from the surface of the lime-stone stratum to the surface of the second grit-stone stratum, without being at first sensible of any dislocation, although the grit is naturally situate so far above the lime. A new fongle for the draining of the Crich-cliff lead-mines is now driving from Fritchley Brook. To the southward of the town the great lime-works are situate, and kilns, from which the country S. and E. for a great way is supplied with lime, by means of the Cromford canal, from whence a rail-way branch extends up into the works. The stone here burns to a very white lime, and is highly esteemed for agricultural purposes as a manure for building and also as a flux at the several iron smelting furnaces in the neighbourhood. The chase, and a common in this parish of about 200 acres, were inclosed by act of parliament in the year 1786. Here also is a large poor-house, whose plan is worthy perhaps of imitation in other districts; several of the surrounding parishes are joined for its support, and send their paupers hither to work and be maintained, paying a settled sum per week for each to the general fund which is managed by trustees on the spot, who superintend the establishment, and account annually to a general meeting of the parish officers and chief inhabitants of the parishes interested. It is impossible for each small parish to have its *work-house*, as the law presumes, but such are almost sure, for want of proper management, to degenerate into haunts of idleness, vice, and misery: in larger establishments persons of sufficient abilities and of character can be retained as governors and masters, &c. and order, and useful labours by such as are able, may be enforced. There are other similar establishments in Derbyshire.

CRICHTON, JAMES, in *Biography*, who, on account of his very extraordinary talents, obtained the epithet of "The Admirable," was descended from a good family in Scotland, where he was born about the year 1551. He was educated at Perth and St. Andrew's, and made a most rapid progress in the whole circle of sciences, as they were then taught and understood. Mr. Rutherford was, at that time, professor at St. Andrew's, but Crichton was not indebted to him alone for his knowledge. He was educated with James I., and had the advantage of instructions from Buchanan and other celebrated professors: to them, as well as to his own natural powers, he must have owed much, for it appears that before he was 20 years of age he had made himself master of all the sciences, and could speak and write to perfection in ten different languages. He had likewise improved himself to the highest degree in the arts of riding, dancing, and singing, and likewise in that of playing upon almost all sorts of instruments. Thus accomplished, Crichton went on his travels, and we find him first at Paris, where he gave the most splendid proofs of his talents. He invited, by public advertisement, all those who

were versed in any art or science, to dispute with him in the college of Navarre, that day six weeks, by nine of the clock in the forenoon, where he would attend, and be ready to answer whatever should be proposed to him in any art and science, and in any of the twelve languages; Hebrew, Syriac, Arabic, Greek, Latin, Spanish, French, Italian, English, Dutch, Flemish, and Slavonian; and this either in verse or prose, at the discretion of the several disputants. During this time, while the whole strength of the learned was preparing for the contest, Crichton regarded nothing but his amusements; nevertheless, when the appointed day arrived, he acquitted himself beyond all expectation, though the dispute was carried on from nine in the morning till six in the evening. The president, at length, after extolling him very highly, on account of the rare and excellent endowments bestowed on him, rose from the chair, and accompanied by four of the most eminent professors of the university, gave him a diamond ring, and a handsome present of money, as a testimony of respect and esteem. Henceforward he was denominated the "admirable Crichton." A display of a similar kind is attributed to him next at Rome, where he appeared, in the presence of the pope, many cardinals, bishops, and professors of science, and displayed such wonderful proofs of his universal knowledge, that he excited no less surprise than he had done at Paris. At Venice he conciliated the public favour by a Latin poem in praise of the city, and contracted an intimate acquaintance with several eminent literary characters. Among these was Aldus Manutius, who has borne his testimony to the extraordinary powers of Crichton, and who has asserted, that he possessed the knowledge of ten languages, as well as of all kinds of science, and all gymnastic exercises; that he had spoken with the greatest applause before the doge and senate of Venice, and in many assemblies of learned men, who flocked from all parts to behold him, and that, in particular, he had held a solemn disputation before the university of Padua, with the most eminent professors, on a variety of topics, especially the Aristotelian philosophy. He afterwards sustained a scholastic conflict for three days, against all opposers, in any form which they chose. His great reputation caused him to be chosen by the duke of Mantua, preceptor to his son Vincenzo, a dissolute youth, who was suspected of having contrived the death of his tutor. The story has been related very differently; but the following seems to be as near the truth as any: One night, during the time of the Carnival, as Crichton was walking along the streets of Mantua, and playing upon his guitar, he was attacked by half a dozen people in masks: the assailants were unable to maintain their ground against him, and the leader, who proved to be his pupil, being disarmed, pulled off his mask, and besought his own life. Crichton fell on his knees, and expressed his concern for what had happened; alleging, that he had only engaged in self-defence, and that if Gonzaga had any design upon his life, he might be always master of it. Then taking his own sword by the point, he presented it to the prince, who immediately seized it, and with savage fury ran him through the heart. This fatal catastrophe happened in June 1583, and excited the greatest affliction among those who were the friends and associates of the deceased. The high pretensions of Crichton have been accurately and candidly examined by the late excellent biographer Dr. Kippis, who has stated the question with impartiality, but who denies upon good authority, we think, that he has any thing like the claims to celebrity that have been ascribed to him. There is no doubt that he possessed uncommon dexterity of body and quickness of understanding, with a considerable degree of confidence.

"One method," says the candid doctor, "yet remains, by which

which we may be enabled to form a judgment of Crichton's genius, and that is, from the perusal of the four poems of his which are still extant." These, by the fair rules of criticism, will be found possessed of a very moderate degree of merit: they are faulty in language and prosody, and must, according to another valuable writer, ever exclude him from the rank of the eminent and cultivated scholars of that age. These poems are to be found in the notes to the article in the *Biographia Britannica*. And the author of that article concludes with saying, that "it is evident that he was a youth of such lively parts as excited great present admiration, and high expectations with regard to his future attainments. He appears to have had a fine person, to have possessed a peculiar facility in learning languages, to have enjoyed a remarkably quick and retentive memory, and to have excelled in a power of declamation, a fluency of speech, and a readiness of reply. His knowledge was likewise uncommon for his years, and this, in conjunction with his other qualities, enabled him to shine in public disputation. But whether his knowledge and learning were accurate or profound may justly be questioned, and it may equally be doubted whether he would have arisen to any extraordinary degree of eminence in the literary world." *Biog. Brit.*

CRICKEITH, or **CRICAETH**, in *Geography*, a poor borough-town of North Wales, in the county of Caernarvon, situated near the coast of the Irish sea, with a weekly market on Wednesday. It is chiefly distinguished by the ruins of a castle, placed on an eminence projecting into the sea, and presenting a fine view across the bay towards Harlech, and its once magnificent castle: 21 miles S. of Caernarvon, and 236½ N.W. of London.

CRICKET, in *Entomology*. See **GRYLLUS**.

CRICKET is also the name of an exercise, or game, with bats and a ball.

CRICKHOWEL, in *Geography*, a small town, or rather village, of South Wales, in the county of Brecon, situated in a beautiful vale near the river Usk, and the line of the *Brecknock* and *Abergavenny* CANAL, and principally distinguished by an ancient castle, now in ruins. The keep seems to have been a very secure building, seated upon a lofty artificial elevation: 6 miles W.N.W. from Abergavenny, 13 E. S. E. from Brecknock, and 149 W.N.W. from London.

CRICKLADE, a town of England, in the county of Wilts and hundred of Highworth; situated on the river Isis, and near to the line of the Thames and Severn Canal, and also in the line formerly marked out for the intended Thames and Avon canal. (See **CANAL**.) Cricklade is a borough-town, but the inhabitants having been convicted of corruption before a committee of the house of commons in 1782, an act of parliament was passed to disqualify those electors who had accepted bribes, and to extend the right of voting for the future to the freeholders of the several hundreds of Highworth, Staple, Cricklade, King's-bridge, and Malmesbury. It has a weekly market on Saturday; 30 miles W. of Oxford, and 83½ W.N.W. of London. By the last return (41 Geo. III.) Highworth, Cricklade, and Staple contain 1722 inhabited houses, occupied by 1999 families, and the total of inhabitants is 9587, of whom 4539 are males, and 5048 females; 6245 employed in agriculture, and 650 in trade, manufacture, or handicraft.

CRICO-ARYTENOIDEI MUSCULI, in *Anatomy*, muscles of the larynx. See **LARYNX**.

CRICOIDEA CARTILAGO; from *κρίκος*, a ring, or circle, and *ἴδος*, form; a cartilage of a circular form, belonging to the larynx. See **LARYNX**.

CRICO-PHARYNGEUS MUSCULUS. Under this name are described those fibres of the inferior constrictor of the pharynx, which have their origin from the cricoid cartilage.

CRICO-THYREOIDEUS MUSCULUS; a muscle of the larynx. See **LARYNX**.

CRÍ DES ARMES, or *Cri d'Armes*, or *Cri de Guerre*, Fr. the cry or shout of arms, or war-hoop: an ancient custom, which is still preserved by the Turks and other uncivilized nations whenever they go into action. The French, Spaniards, English, and every nation in Europe formerly practised it. The national acclamations were Montjoie and St. Denys for the French, St. James for Spain, St. George for England, St. Malo or St. Yves for the dukes of Brittany, St. Lambert for the principality of Liege, St. Andrew for Scotland, St. Patrick for Ireland, &c. The war-hoop of the savages in America may be considered as of this nature.

Every sort of noise however is now exploded among the nations of Europe, the Turks excepted. When two armies are ready to engage, the soldiers, on both sides, are attentive to the word of command, and a profound silence, till it is given, prevails. And when the action once commences, nothing is heard but the noise of drums, trumpets, and cymbals, of cannon and musquetry.

The French soldiers sometimes call out *tué, tué*, in making any desperate attack, or in charging with the bayonet, or when one battalion or squadron is directly opposed to another. And the Spaniards sometimes bawl out *amal*. Such effusions or exclamations, however, are apt to lead to confusion and disorder.

CRIEFF, in *Geography*, a town of Scotland, in the county of Perth; 17 miles N. of Sterling, and 16 W. of Perth.

CRIEL, a small town of France, in the department of the Lower Seine; 6 miles S.W. of Eu.

CRIER, **COMMON**, an officer in the city of London, to whom, and to the serjeant at arms, it belongs to summon all executors and administrators of freemen to appear, and to bring in inventories of the personal estates of freemen, within two months after their decease; who is also to have notice of the appraisements. He is also to attend the lord-mayor on set days, and at the courts held weekly by the mayor and aldermen.

CRILLON, **LEWIS DE BERTHON DE**, in *Biography*, distinguished as a military character, was born in 1541. He served at the siege of Calais at the age of 15, and afterwards signalized himself in many battles against the Huguenots. In 1571, at the battle of Lepanto, he was wounded, but fixed upon as a knight of Malta to carry the news of the victory to the pope and the king of France. He was a great favourite with Henry III., yet scorned to do a base act at his desire. When Henry urged him to assassinate the duke of Guise, his own, as well as his sovereign's foe, the soldier scorned to be concerned in so foul a deed. By Henry IV., whom he served with fidelity, he was regarded as a brother in arms, and the monarch ever designated him as the brave Crillon, and treated him with the familiarity of a friend; but never rewarded him according to his merits. Ill health obliged Crillon to retire from service, and he spent his latter days in exercises of piety and penitence. He died in his 75th year at Avignon. Many amusing and interesting anecdotes have been told of this warrior; of these we shall mention but one. Being awakened in the dead of night by the young duke of Guise, and informed that the enemy was in possession of the town, he was urged to escape, rather than to become prisoner. Crillon quietly took his arms, and declared

clared he had rather die at his post. When he was apprized that it was a mere trick to try the preference of his mind; he looked sternly at the youth, and seizing him, said, "Young man, never amuse yourself with founding the courage of a man of character. Had I in this instance betrayed any weakness, I would have run you through."

CRILLON, in *Geography*, a small town of France, in the department of Vaucluse, formerly called the Comtat Venaissin; 6 miles N.E. of Carpentras.

CRIM, *ESKI CRIM*, *Crim Staroi*, or *Old Crim*, a small town of the Crimea, from which the whole peninsula has probably derived its name, is situated in a fertile plain on the slope of a mountain, and was doubtless the *Cimmerium* of the ancients. It is remarkable for numerous and extensive ruins. The first that strike the eye on coming from Burunduk are those of two Tartar mosques near the road, a fountain, and the remains of a large Armenian church. Beyond the town are some vineyards of the tockay plant. Its modern name is *Leucopolis*.

The ancient palace of the Chans who resided in this place before they removed to Baktshifarai is in a tolerable state of preservation, and until the year 1800 the Russian bishop of the Taurida inhabited here a very handsome and extensive palace, which had been built for the empress Catharine II. when she made her famous tour through the Crimea.

The beautiful orchards which surrounded Eski Crim are almost destroyed, and few are left of those numerous mulberry trees which induced prince Potemkin to establish a nursery for rearing silk-worms and a silk manufactory near this place. Both establishments have dwindled into nothing. Professor Pallas observes that if ever the Crimea were peopled with colonies of Georgians and Armenians, they would soon increase the commerce of Russia by several hundred poods of silk and promote other useful branches of trade.

All the environs of Eski Crim contain traces of a formerly considerable population. It was considered as the capital of the country by the Genoese when they were in possession of the peninsula. "Pallas's Travels through the Southern Provinces of the Russian Empire," vol. iii.

CRIM *Steppe*. See *NOGAI*.

CRIM *Tartars*, or *Crimskoi Tartars*, a race of Tartars inhabiting the Crimea, who, like the genuine unmingled Tartars from whom they spring, are of a middling stature and lean, the mouth and eyes small, the hair dark brown and the teeth firm and white. Temperance and cleanliness form a law of their religion, which is that of Mohammed. They are extremely hospitable. Their manners are mild and generous. Their *Kaima* Chan, or commandant, is supreme judge of all litigious matters and offences, except cases of murder; and he pronounces without appeal on the sole authority of the Koran. They have some difficulty to accustom themselves to European manners and to the domination of the Russians. Their *murzas*, chiefs, or nobles, generally reside in the country.

The houses in the towns, as well as in the villages, are for the most part of square timbers, having the interstices filled with brick-work or with turf. The chimneys and crannies are made tight with clay and then plastered within and without. Only the mosques, minarets, and baths are of stone, and a few of marble. They have chimnies in the rooms, but no stoves. Their custom is to sit upon low sofas with Turkish coverings and cushions, or upon a clay seat raised a little above the ground and spread with a carpet.

The residence of the chans was at Baktshifarai, which is still the principal Tartar town of the Crimea.

The Tartar mountaineers of Kikensis Limena and Simaus in the south have a particular physiognomy. Their faces are uncommonly long, their noses aquiline and out of all proportion, their heads high and flat at the sides, their beards and hair of a clear brown, reddish, or white colour, which is so very rare in the Crimea. Their feet are admirably light, and they jump from stone to stone like dancers. Their huts are, like those of almost all the inhabitants of the south of the peninsula from Balaklava to Ajushta, built in general against the terraces of the rock and partly excavated in the rock itself, having but two oblique and transverse walls in front; the roof, which is flat, is covered with turf, and is commonly on a level with the terrace of the mountain, so that they can pass from the rock to the roof. The interior of these huts contains a spacious fire place and a tunnel for the smoke. The stony nature of the soil in their vicinity will not admit of their using the great Tartarian wheeled plough; they employ a pole with a ploughshare. To bring their wood for building and fuel down from the mountains they make use of a particular kind of truck called *kafak*, to which they fix two oxen; and these animals, which are generally small, are of the same advantage to them as mules, in ascending or descending the mountains.

The mountain Tartars keep a few horses, which are likewise small, but uncommonly hardy and very surefooted; they have numerous herds of goats, and their sheep, like the goats, are of a small size with a little fat tail, but covered with a very fine wool which might be brought to the greatest perfection by means of Spanish rams.

These mountain Tartars are of an entirely different race, and even their dialect differs considerably from that of the Tartars who inhabit the valleys to the north. They must be the descendants of other nations who had been driven to the peninsula or who came from the sea coast. For this reason those who are properly called the Tartars of the Crimea consider them as foreigners, and give them the contemptuous name of *Tat*. "Tooke's View of the Russian Empire," vol. ii. "P. S. Pallas's Travels through the Southern Provinces of the Russian Empire," vol. iii.

CRIME, a breach or transgression of a law, or an action contrary to the purport of a law, either natural or divine, civil or ecclesiastical: to which a penalty is annexed.

The term crime includes in it the idea of a determination and design formed to do an injury. It is derived from the Latin *crimen*, of *crimare, judico, I judge*.

The Romans distinguished two kinds of crimes; *viz. private*, which only affected particular persons; the prosecution whereof was not allowed by the laws to any but those interested therein; as adultery, &c. and *public* crimes; the prosecution whereof was permitted to all persons, though in no-wise immediately interested.

A *crime*, considered as an act committed, or omitted, in violation of a public law, either forbidding or commanding it, is a term synonymous with *misdemeanor*; and both may be comprehended under this general definition; though, in common usage, the word "crimes" is made to denote such offences as are of a deeper and more atrocious dye; while smaller faults, and omissions of less consequence, are comprised under the gentler name of "misdemeanors" only. The distinction of public wrongs from private, of crimes and misdemeanors from civil injuries, seems principally to consist in this; that private wrongs, or civil injuries, are an infringement or privation of the civil rights which belong to individuals, considered merely as such; whereas public wrongs, or crimes and misdemeanors, are a breach and violation of the public

public rights and duties, due to the whole community, considered as a community, in its social aggregate capacity. In all cases the crime includes an injury; every public offence is also a private wrong, and somewhat more; it affects the individual, and it likewise affects the community. Accordingly, in taking cognizance of all wrongs, or unlawful acts, the law has a double view; *viz.* not only to redress the party injured by either restoring to him his right, if possible; or by giving him an equivalent; but also to secure to the public the benefit of society, by preventing or punishing every breach and violation of those laws, which the sovereign has thought proper to establish for the government and tranquillity of the whole. See PUNISHMENT.

Military crimes and offences are, strictly speaking, those crimes and offences that are cognizable by courts martial, and are described in the articles of WAR, which see.

CRIME, *Quasi*. See QUASI.

CRIMEA, or CRIM TARTARY, anciently the *Chersonesus Taurica*, a southern province of Russia, in Europe, in the government of Taurida, between the 44° 44' and 45° 63' of northern latitude; bounded to the south-west and north-west by the Black Sea, to the east and north-east by the sea of Azoph; and joined to the continent on the north by a narrow isthmus or neck of land; whence it is also called the Crim Peninsula, or Peninsula of the Crimea. This isthmus is not above six miles in breadth from the sea of Azoph, or rather an arm of it called the Sivash, to the Black Sea. The moat which separates the peninsula from the main land is not very wide; in the middle of it is a handsome bridge adorned with the arms of Russia. This moat is only two miles distant from the fortress of Perecop, called by the Tartars *Or-Capi*, which is but an insignificant village. See PERECOP.

As the whole peninsula of the Crimea is connected with the continent by the isthmus of Perecop only; professor Pallas conjectures that the Crimea was formerly detached from it and constituted a complete island; but this must have been at a time when the Black Sea had a much higher bed; and that its bed was higher is sufficiently attested by passages of the ancients. Pliny, in the fourth book of his Natural History, chap. xxvi., says: "Sed a Carcinite Taurica incipit quondam mari circumfusa et ipsa, quo nunc jacent campi; deinde vallis attollitur jugis."

At a very ancient period this isthmus had been fortified in order to protect the peninsula from the irruptions of the Tauro-Scythians. The means of defence consisted of a wall furnished with turrets, from which the place received the Greek name of *Neon Teichos*, or the new wall.

The first known inhabitants of the Crim were *Cimmerians*, a great and martial people of the race of the Thracians. Of all their extensive possessions, which were ravished from them by the Scythians, they retained the Crim the longest. Six hundred and sixty-five years before the Christian æra, they were, it seems, driven from the plain by these their stronger neighbours; but maintained their station in the mountains under the name of Taurians or mountaineers. From them the whole peninsula obtained the appellation *Taurica*.

In the former half of the sixth century Greeks began to settle in the Crim. The Milesians built Panticapæum or Bosphorus, at present called Kertsch, and Theodosia, now called Cassa; and an uncommonly flourishing commerce was carried on here by the Greeks.

About a hundred years afterwards, the Scythians were for the most part exterminated by the Sarmates. The Taurians then extended their dominion over nearly the whole peninsula. They pressed so hard upon the empire of Bos-

phorus, that it submitted 112 years before the birth of Christ to the great Mithridates, king of Pontus, who, subduing the Taurians, made himself master of the whole peninsula.

In the beginning of the Christian æra, the Alans forced the Bosphorian kings to pay them tribute, and drove away the Taurians. They maintained their power about one hundred and fifty years, and were succeeded by the Goths, during whose dominion Christianity was first introduced into the Crimea, in the time of Diocletian and Constantine the Great. But the Goths in their turn were obliged to submit to the Huns, and to take refuge in the mountains, where they had their own sovereigns, who were Christians; and the kingdom of Bosphorus was entirely extinct towards the close of the fourth century.

The Hungarians who, with the Bulgarians, had conquered all the country between the Don and the Dniester, entered the Crimea in 464. The Goths and Alans went to Taman.

The descendants of the Hungarians took the name of Aoulziagrians, and led a wandering life in the Crimea, but were obliged to submit to the Khatyars, who made likewise the Goths in the mountains, and the Grecian towns on the coast, their tributaries.

In the year 840, the emperor Theophilus erected a government at Cherson, to which he subjected all the other towns of the Crimea and Cuban; for though these countries were tributary to the Khatyars, they yet acknowledged the supremacy of the Byzantine court. However, from the time that the Khatyars had first conquered the Crimea, that peninsula had taken the name of Khat or Gatyaria, except the mountainous part, which was called Gothia from the Goths, and Tfikia from the remaining Alans. Jews were then numerous in the Crimea.

The Petschenegers, or Kangleians, in 882, drove the Hungarians from the Crimea, and about the middle of the eleventh century were forced in their turn to fly before the Komanes, otherwise called Uzes, Butyes, Polostzes or Polouzes, who also extorted a tribute from the Greeks and Goths that were left in the Crimea. About this time the town of Sougdaia or Sugdaya, now Sudak, rose into such consideration by its commerce, that all the Grecian possessions in the Crim received the name of Sugdania; and, in 1204, the Greeks no longer acknowledged the supremacy of the Byzantine empire. They submitted to different princes. When the Ottomans made themselves masters of the empire, there existed two principalities in the Crimea, one called Theodor, now Inkerman; and the other Gothia, now called Mangoutc.

At length the Komanes were subdued by the Mongoles or Tartars, in 1237, and from that time the Crim formed a province of the Kaptschakian Tartar empire. The people were governed in clans by their own princes, to whom the name or title of ulutz-bey, or ough-beigh, was given, and who roamed about the plain with their hordes. The Greeks and Goths paid tribute to the Mongoles, as they had before done to the Komanes.

In the beginning of the Tartar dominion, a number of Tcher, Caffes, or Circassians, established themselves in the Crimea in 1333, and Kertsch was governed by a prince of that nation.

While they were masters of Constantinople, the Latins, and especially the Venetians, carried on a very important commerce with the Crim and Taman. But, in later times, the Genoese appropriated it exclusively to themselves, and, in the bloody wars which ensued in consequence, they often gained the superiority. By permission of the Mongoles they

rebuild

rebuilt Caffa, and made that to be the centre of their commerce. They conquered Sudak and Cenibalo, now called Balaklava. They paid duties and imposts to the Mongoles, when they were in full force: but when the hordes were agitated by intestine commotions, they bid them defiance, and even the princes of the Tartars were frequently elected and deposed at the discretion of the Genoese. It was at this period that the trade from India to the Crimea was divided into two branches; one over the Amoor, the Caspian Sea, and through Astrakan to Tana; the other by the way of Bagdad and Tauris to Trebizond and Sevastopolis. Tana belonged to both the Genoese and the Venetians, but under Mongolian supremacy.

In 1441, the Crim was formed into a separate Chanate, under the dominion of the Tartars; and the Chans were descendants from the house of Tschinghis-Khan. The proper founder of the Tartar Crimean state was Mengly Gheray, a descendant of the Tschingises. While yet very young, he had been taken prisoner in an engagement by the Genoese, who caused him to be well educated, and in all respects treated like a prince. On being driven to extremities by the Tartars, young Mengly was sent with some of the principal Genoese to Constantinople, for the purpose of moving Mohammed II. to take them under his protection. The sultan shewed great affection to Mengly, and when the Tartars petitioned Mohammed to give them a Chan of their own, he appointed this young prince, who, in return, acknowledged the supremacy of the Porte. This state of dependence not proving agreeable to the Tartars, Mengly, not long after his arrival in the Crim, was obliged to apply for assistance to the Turks, with which he not only reduced the Tartars to obedience in 1475, but even annihilated the Genoese authority in the peninsula. Elated with his conquests, Mengly was thinking of withdrawing himself entirely from the supremacy of the Porte, when the Turks sent garrisons to the principal towns of the Crimea, and reduced the Chan to a dependence, which, particularly from the year 1584, sunk into a complete subjection. Not contented with keeping strong garrisons in the forts of the Crimea, and setting up and deposing the Chans at pleasure, the Turks shut up the entrance of the Black Sea, to other nations, and completely ruined the commerce of the peninsula.

Under the austere despotism of the Turks, the Crim continued till the year 1774, when the empress of Russia, Catharine II., by the peace of Kutschuk Kainardgi, procured the independence of the Chan of Crim Tartary; and obtained for the Russian empire some strong places on the frontiers as a safeguard against the predatory incursions of the Tartars.

But this pretended independency of the Crimea created new troubles. Sahim Gheray, the Chan who had been placed over the Tartars of that peninsula by the power and influence of Russia, made a more ostentatious display of his attachment and even vassalage, than was suited either to his character as Chan, or to that of the people whom he governed. They had always considered liberty as the most invaluable of human blessings, and preferred a connection with the Ottomans with whom they had been so long united, who were of the same religion, and in conjunction with whom they had shared so much glory and spoil in war, to their new alliance with a Christian nation which they had been in the habit of regarding either with enmity or with contempt. Their discontents broke out in 1781. They elected a new Chan. A civil war ensued. Sahim Gheray was worsted. Russia sent her forces into the Crimea to support him against the rebels. The Russians defeated the usurper, and obliged him to abandon the peninsula. His

adherents were either dispersed or subdued. In 1783, Sahim Gheray abdicated his power and transferred it to Russia, and in the beginning of the year 1784, by a treaty signed at Constantinople between the Russian plenipotentiary Bulgakoff, and the ministers of the Grand Signior, Russia retained the sovereignty of the Crimea, of the isle of Taman, and a great part of the Cuban. In 1787, the empress visited her new provinces, where she was met by the emperor Joseph II. of Germany. But the unfortunate Sahim Gheray was no longer in the Crimea. He had been dragged from the place of his retreat in Moldavia to the island of Rhodes, and was assassinated by the Turks in the house of the French consul, where he had taken refuge.

The principal remains of antique monuments are found in the south-west angle of the peninsula around Sevastopol, or Atkiar, which is true classic ground. The whole of this angle, which is intersected on one side by the port of Atkiar, and on the other by that of Balaklava, was formerly called the *Heracleotic Chersonesus*, from some Greek colonists that came from the town of Heraclea, in Asia Minor. It forms exactly, as Strabo observes, a large cape or promontory. "In littore, præter quod navigatur, meridiem versus expositum est magnum promontorium, continenter porrectum, portio totius peninsulae; inque eo sita est urbs Heracleotarum, colonia eorum qui sunt in Ponto, nomine Cherronesus." And farther, is (portus Symbolon, the port of Balaklava;) "cum alio portu, Ctenuntem appellant," (which can be no other than that of Atkiar), "isthmum constituit, stadiorum quadraginta; is est isthmus, qui parvam peninsulam claudit, quam magnam peninsulae partem esse diximus, et in se habere cognominem sibi urbem Cherronesum." Between the great port of Atkiar and the point of Fanary are four bays, which might form as many ports; "inter urbem," (Cherronesum, adds Strabo,) "et promontorium (Parthenium), portus sunt tres." He, probably, does not reckon the round bay, which is not so convenient for a port. The next to that of Atkiar, and at the same time the smallest of these bays, to the east of which is the town of Korfun, or Cherronesus, is also, at the present time, called by the Tartars Tshortshun, and by the Russians Karantinnaya Bukta, on account of quarantine being performed at this place.

Vestiges of antiquity are scattered in every direction over the whole Heracleotic Cherronesus: but there are no traces of old buildings, except in the vicinity of the monastery of St. George, along the southern coast, where are three remains of a wall and some square and round towers, which probably indicate the place on which stood the wall that, according to Strabo, formerly inclosed the Cherronesus from the port of Balaklava to that of Atkiar to the extent of forty furlongs, or eight versts. "Cum autem hi (Scythæ) et murum quo interclusus erat isthmus ad Ctenuntem aggredierentur, ingestisque calamis fossam impleverit; regii quantum ab his interdium quasi ponte factio fratum fuerat, noctu incenderunt." There is, however, no longer any vestige of a ditch.

Not far from thence are the remains of a singular building which professor Pallas supposes to have been the *Fanum Damonis Virginis* mentioned by Strabo. There are also several frames of stone, in a circular form, which Mr. Pallas takes for the ancient tombs of the Cherronesites.

The most remarkable district, however, of the Cherronesus, in point of antiquity, is the remotest part of the tongue of land called Fanary, which, in some maps, is erroneously denominated Cape Famar; and there is every reason for supposing it to be the ancient Cherronesus of Strabo. "Inter urbem,

ubem, (the new Cherronefus) et promontorium (Parthenium) portus sunt tres; fequitur vetufta Cherronefus, diruta, et poft hanc portus angufto introitu; portus fymbolorum dicitur." Therefore, the fituation of the ancient town muft have been betw. en the latter bay and Balaklava, the port of which was Symbolon, which the Genoefe called Cembalo. Ruins of fortifications, and foundations of large buildings are numerous here. But the light-houfe, at the corner of the moft advanced western point, appears to have been a modern building, and either the work of the Genoefe or the new Cherfonites. The name of Fanary (lanthorn), fufficiently indicates that this tower was ufed as a pharos, from whence the whole cape has derived its name.

The ruins of the new town of Cherronefus, which flourifhed in the time of Strabo, are feen near Atkiar. Mr. Pallas found a fine infcription on white marble, relating to the repairs which the fortrefs underwent in the reign of the emperor Zeno. Broken columns, fculptured marble, and copper and filver coins of the reigns of Gordianus, Aurelian, Aurelius, Conftantine, and even Auguftus, are frequently found, together with remains of enamel and common glafs; but gold coins are fcarce.

Another very remarkable piece of antiquity, but of a later date, is the ancient fortrefs of Inkerman, fituated at the extremity of the bay of Atkiar, with fome very curious caverns; which town Formafioni in his "Philofophical and Political Hiftory of the Commerce and Navigation of the ancient Colonies in the Black Sea," publifhed at Venice in 1789, fuppofes to have been the *Ctenus* of the ancients. But the caverns appear to be the work of the monks, under the emperors of the middle age. Similar cells are obferved in other parts of the Crimea.

When Ruffia obtained poffeffion of the Crimea, the following countries were confidered as forming part of the peninfula, viz.: the eaft and weft Nogaik Tartary between the Dnieper and the Berda, which the Ruffians call the Crim Steppe; an extenfive traft of Bessarabia between the Dnicfter and the Danube, the Black Sea, and Moldavia, called the Budgiak; the Cuban or eafternmoft part of the continent, and the ifle of Taman. But the Crimea itfelf has only 225 Englifh miles in circuit, and its extent does not exceed 1242 Englifh fquare miles. Its climate is mild. Its temperature unequal, but falubrious, the fummer's heat being tempered by frequent winds, and the winter having rarely more than three consecutive days of fevere froft, which never exceeds the tenth degree of Reaumur's thermometer.

Three fourths of the peninfula to the north form an undulated plain, the foil of which varies very much. At its fuperficies, and in its greateft extent, but particularly at the angle between Perecop and Koflof, it confifts of fand combined with clay. In the vicinity of the falt lakes it is of an argillaceous quality.

The whole country from Perecop to the river Salgir abounds with falt marfhes and lakes, from whence the neighbouring Ruffian governments, as well as the Crim itfelf, Anatolia, and Bessarabia, are fupplied with falt. Caffa alone ufed to export 200 cargoes annually.

The Crimea may be divided into the flat country and the mountainous. The former, which extends from Perecop to Koflof, and from the river Bulganak to Karafubazar, Caffa, and Yenikaly, is fprinkled with a number of fmall Tartar villages; which, however, have been greatly deferted fince Ruffia acquired the country. The care which the Tartars take in their towns and villages, to procure water from the heights at a diftance, cannot be too highly commended. They employ tunnels of clay, which run under ground into

ftone refervoirs; the water of which feives to irrigate their gardens, and to fupply the ditches, which carry off the impurities of the ftreets. The Tartarian police carefully watches over this canal fyftem, which, in the Ruffian towns, is fuffered to go to deftruction by careleffnefs and neglect. The mountainous part of the Crimea is towards the fouth, along the Black Sea. The oldeft and higheft mountains extend from Balaklava to the vicinity of Theodofia or Caffa. Their elevated platforms are covered with fnow to the end of May. The Tartars, who feed their flocks on them in hot fummers, call thefe Alps Yaila. The Tibatyrdagh, or mountain of the Tent, near the village of Shuma, or Shumai, is reckoned the higheft of the mountains of the Crimea: its perpendicular elevation is nearly 1200 feet above the level of the fea. No traces of metals have yet been difcovered; but among the calcareous rocks is an excellent marl, of the nature of fuller's earth, of a greyifh colour, and poffeffing the property of foap. The mountains are covered with forefts, which yield excellent fhip timber. The vallies produce all forts of corn, chiefly wheat, barley, and millet; fine garden fruits, and excellent wine, particularly in the neighbourhood of Sudak, where it refembles champaign both in colour and in ftrength.

Elevated plains and agreeable vallies, covered with the fineft verdure, and fituated between perpendicular calcareous mountains, efpecially on the fouth fide of the peninfula, form a moft enchanting fcenery. The valley of Baidari, fo extolled by all travellers, but particularly by the margrave of Anfpach (lady Craven), on account of its charming fituation, was given to prince Potemkin, and is really enchantingly interefting. The fine and rich wood of this valley, which is only interrupted by open and well cultivated lands, confifts of every leafy kind; among which there are fome large oaks and walnut trees. One of the latter, in a garden of the village of Urkuffa, affords in fome feafons from 80 to 100,000 nuts. Mr. Pallas himfelf had one in his garden at Stulu, which was not much fmall; and in the grounds of admiral de Rebas, near the Belbek, was an oak of a monftrous fize, meafuring, at the height of a man, 30 feet in circumference. The valley of Sudak is thickly planted with vines.

From the number of plants mentioned by profeflor Pallas, it appears that the vegetation of the Crimea is extremely luxuriant. The wild horfe-radifh, or *crambe orientalis*, is in particular very abundant between the rivers Salgir and Suga, and often thicker than a man's arm. The margrave of Anfpach affirms, that it is the ftrongeft and beft flavoured horfe-radifh fhe ever tafte; and that the root is as long and as big as the ftouteft leg ever feen by the late margrave of Anfpach.

The two moft confiderable rivers of the Crimea are the Salgir and the Karafu; befides which the peninfula is interfefted by numerous other rivers, as the Alma, Belbek or Kabarta, Byuk or Kafiky Ufen, Aithodor, Bulganack, Badrak, Katfha, Daffafu, Burultfha, which in other mountainous countries would only be confidered as rivulets, but which after a ftorm are really rapid and dangerous torrents.

The prefent capital of the Crimea, for the choice of which prince Potemkin tiffed up with his generals, is Akmetfhet, or Sympheropol. The latter is its modern Greek name. The other towns of the Crimea are Perecop, Baktfiferay, Karafubazar, Mangup, Koflof or Eupatoria, Leucopolis, Inkerman, Baluklava, Aljuchta, Sudak, and Ynikale.

The maritime town of Sevaftopol, or Atkiar, was founded immediately after the occupation of the Crimea by the

the Russians, on account of its excellent harbour. Caffa or Theodosia and Kertsch are reckoned the next best ports.

The peninsula of the Crimea was formerly extremely populous; but the long troubles which preceded its subjection to the Russian empire, have caused numbers of Turks, Jews, Greeks, and Armenians, to emigrate; and the Tartars have since fled in such numbers, that Mr. Tooke rates the population of the Crim, in 1782, at only 50,000 individuals, whose numbers, as it appears from later accounts, have not been considerably increased. Tooke's *View of the Russian Empire*, vol. ii. *Life of Catharine II.*, 2d edition, 1798, vol. ii. *Voyage en Crimée*, Paris, 1802. P. S. Pallas's *Travels through the southern Provinces of the Russian Empire*, vol. iii. *Marguerite of Aspach's* (Lady Craven's) *Journey through the Crimea to Constantinople*, 1789.

CRIMELN, a town of Germany, in the circle of Upper Saxony, and territory of Neudorf: 2 miles N. of Weyda.

CRIMEN FALSI, in *Law*. See **FALSI**.

CRIMHALL, or **CRIMBLE** *P-fing.*, in *Geography*, the extremity of a point of land in Plymouth-dock, in Cornwall. The exact situation of the obelisk was determined, in the government trigonometrical survey in 1795, by an observation from Butterton station, distant 69,376 feet, and bearing $74^{\circ} 7' 9''$ N.E. from the parallel to the meridian of Butterton; and another from Kitt's-hill, distant 63,803 feet: whence is deduced its latitude $50^{\circ} 21' 38''.6$, and longitude $4^{\circ} 0' 53''.3$, or $16^{\circ} 39'.5$ W. of Greenwich.

CRIMINAL CONVERSATION, in *Law*, is used as synonymous with *adultery*.

CRIMINAL Law, is that which discusses the nature of crimes, and inflicts suitable penalties; or, as it is more usually denominated in England, the doctrine of the *PLEAS of the crown*; which see. For the method of pronouncing capital sentence on criminals in the canton of Bern, see **BERN**.

From an account, just now printed, of the number of criminals executed in the city of London and county of Middlesex, from the year 1749 to the year 1806 inclusive, shewing the proportion in each seven years, and distinguishing years of war from years of peace, it appears, that during the seven years of peace which preceded the war of 1756, the number of criminals, executed in the city of London and county of Middlesex, was very considerable, being on an average 43 a year:—in the seven years of war which succeeded, they were reduced to about 15 a year:—in the seven years which followed the peace of 1763, the number again increased, but not to more than 26 a year upon an average:—in the seven years which followed, from the year 1770 to 1776 inclusive, which was likewise a period of peace, the number further increased to 38 a year:—from the year 1776 to the year 1783, a period of war, first with America, and afterwards successively with France, Spain, and Holland, the number, instead of decreasing as in the former war, still further increased, the average being, during these seven years, about 39 a year:—from the year 1783 to the year 1790, a period of peace, the average continued increasing to 54 a year, and the years 1785 and 1787 were great beyond all former example: from 1793, the year in which the existing police establishment was first instituted, to the present period, the numbers appear to have progressively diminished; till within the last seven years the average has not been 12 a-year. This period has, with the exception of one intervening year of peace, been a period of war; but during that year, though the militia was disbanded, some part of the army, and a considerable part of the navy,

reduced, the number of capital convicts does not appear to have increased. The example of the American war, and of the year 1802, are sufficient to prove that the increase of capital offences cannot be traced exclusively or even principally to the different operations of war or peace; though it is natural to suppose that the first may have some effect in diminishing, and the latter in increasing, the number of them.

From an account of the number of criminals executed in the city of London and county of Middlesex, between January 1, 1749, and December 31, 1806, shewing the various crimes of which they were convicted, it appears, that the whole number amounted, within this period, to 1788:—that the number of murders, from the year 1771 to the present period (1808), have remained nearly the same; but that they were considerably more upon an average, in the 20 years preceding:—and that a most important change has taken place respecting the crimes of burglary and highway robbery; these offences in their aggravated character, in which it is found necessary to apply capital punishment to them, having nearly disappeared, within the county of Middlesex. From other statements it appears, that the number of prisoners committed to Newgate during the last six years (from 1802 to 1807 inclusive), charged with criminal offences of various kinds in the cities of London and Westminster, and county of Middlesex, amounted to 6254, of whom 4284 were males, and 1970 females: the total of persons executed in these six years includes 61 males, 7 for murder and 16 for forgery, and 3 females.

From an account of the number of criminal offenders, committed to the several gaols of England and Wales for trial, in the years 1805 and 1806, it appears that in the former year were committed 3267 males and 1338 females, and in the latter year 3120 males and 1226 females; and in the former year 350 received sentence of death, and 68 were executed; and in the latter, 325 were sentenced to die, of whom 57 were executed. From an account distinguishing the commitments in each county, it appears that the number of offenders in the county of Middlesex amounts to more than one-fourth of the whole; and that the number, in proportion to the population, in the counties most contiguous to London, is nearly double the number of the same population in the more remote counties.

It appears likewise, that the northern counties possess a very great advantage, both with respect to the small number of offenders and paupers, when compared with the rest of England. This observation applies, not only to the counties within the northern circuit, but likewise as far as relates to paupers generally, to all the more northern counties. The counties of Lincoln, Nottingham, Derby, and Rutland, the most northern counties in the midland circuit, and those of Staffordshire and Shropshire, the most northern in the Oxford circuit, appear to be, in this respect, in the same comparatively favourable situation as the counties within the northern circuit, when compared with the other more southern counties of England, Middlesex, Monmouth, and Cornwall alone excepted.

CRIMISA, or **CRIMISSA**, in *Ancient Geography*, a promontory of Italy, in the country of the Bruttii.—Also, a town of Italy, in the same country, situated on the fore-mentioned promontory, before Crotona and Thurium, and said to have been founded by Philoctetes. It is now *Ciro*.

CRIMISUS, or **CRIMISSUS**, a river of Italy, in the country of the Salentini, whose mouth was in the gulf of Crotona.—Also, a river of Sicily, which discharged itself into the Hyphas. This river was famous among the ancients for its god, who, in the shape of a dog, found tra-

our in the eyes of Ségesta, and is represented in that form on the Segestan coins. Some have supposed that this was the present San Bartolomeo; but Cluvier thinks that the Belici was, by its size and depth, better adapted to the description given us of the victory obtained on its banks by Timoleon over the Carthaginians.

CRIMMITZSCHAU, in *Geography*, a small town of Saxony, on the river Pleisse, in the circle of the Ertzgebirge, famous for its woollen and cotton manufactures, conducted on the English plan, and provided with excellent machinery. The chief sale of these manufactures is at Leipzig, but great quantities are also exported immediately from Crimnitzschau to Russia, Poland, Turkey, Italy, Spain, and Portugal.

CRIMNOIDES, or **CRIMOIDES**, formed of *crimus*, *bran*, in *Medical Writers*, is used for urine with thick sediments at the bottom, like bran.

CRIMSON, in *Dyeing*, is produced by various processes according to the nature of the substance employed, and the kind of stuff destined to receive the colour. Wool and silk are dyed either with cochineal or Brazil; with the former the colour is more fixed and permanent, and is called the true or fine crimson; Brazil gives a fine colour, but does not resist the action of the sun and air so well.

All the processes for dyeing wool crimson with cochineal may be reduced to two. Either the shade desired is given to cloth previously dyed scarlet, or the cloth is dyed crimson at once.

The natural colour of cochineal is crimson, and it affords this colour both with alum and the solution of tin, when its effects are not modified by the action of tartar, as has been shewn by Bancroft. When cloth therefore that has been dyed scarlet in the usual way is boiled in a solution of alum, the natural hue of the cochineal is restored, and the cloth becomes crimson. Alum, salts with earthy bases in general, the fixed and volatile alkalies all effect this change; the quantity necessary to produce any determinate shade, varies considerably with the nature of the water employed. Some which is loaded with earthy salts will answer the purpose without the addition of alum, or any other substance whatever.

Hellot tried soap, soda, and potash; all these substances produced the colour desired, but saddened it and gave it less lustre than when alum was employed. Ammonia, on the contrary, produced a very good effect; but it evaporates quickly from the bath and requires a considerable quantity. Hellot replaced the use of it, by adding equal quantities of muriate of ammonia, or common sal ammoniac, and potash; the ammonia was disengaged in the bath, and in this way the cloth instantly took a very bright colour. He asserts that the colour is so much heightened as to render less cochineal necessary. Mr. Poerner has given nearly the same process. He directs the cloth to be boiled an hour in a solution of common salt in the proportion of 2½ ounces to 1 lb. of wool, and to let the cloth remain in it 24 hours after it is become cool. A bath is prepared with 1 ounce of cochineal, 2 drams (gros) of tartar, and 2 ounces of solution of tin for every pound of cloth, and in this it is boiled one hour. When washed it is steeped in a vat, in which equal quantities of sal ammoniac and potash, in the proportion of 6 drams of each to a pound of cloth, have been previously dissolved; it is suffered to remain here 24 hours, frequently turning and moving it in the liquor. It is afterwards taken out and washed. The colour is a reddish crimson inclining to blue.

This mode of producing crimson by the action of alkalies or alum, is generally resorted to when cloth dyed scarlet

has been stained or spotted by accident. These defects are thus remedied or rendered less glaring. Muriate of soda, or common salt, has also the property of converting scarlet to crimson, and has long been used for this purpose in Languedoc, according to the testimony of Hellot.

To dye crimson at once, a solution of two ounces and a half of alum, and an ounce and a half of tartar to every pound of cloth, is used for the boiling; the cloth is afterwards dyed with 1 ounce of cochineal. Solution of tin is commonly added, but in less proportion than for scarlet. The processes employed vary greatly according as the shade required is deeper or lighter, or more or less removed from scarlet. Some use common salt for the boiling.

Mr. Poerner directs the boiling to be made with 3 ounces of common salt and 3 of alum, to 1 pound of cloth, and after suffering it to remain 24 hours in the solution after cooling, to boil one hour in a bath composed of 1 ounce of cochineal, 2 drams of tartar, and 2 ounces of solution of tin. The cloth takes a reddish crimson.

A bright reddish crimson of very agreeable hue may be obtained by boiling 1 lb. of cloth a full hour in a bath prepared with 3½ ounces of alum and 2½ ounces of tartar, suffering it to remain 24 hours in the liquor after cooling. Then boil an hour and a half in a bath composed of 1 ounce of cochineal only, without any other ingredient. If this cloth be steeped 24 hours in a cold solution of 1½ ounce of sal ammoniac, and 1½ ounce of potash in 20 lbs. of water, the colour becomes deeper, and another shade of crimson is by this means obtained.

Archil and potash are frequently used for saddening crimsons and giving them more bloom, but the hue thus imparted soon vanishes.

The boiling for crimson is sometimes made after a scarlet dyeing, by adding alum and tartar to the bath, and some particular shades of crimson are said to possess more bloom when dyed this way, than when fresh baths are used.

Crimsons in half grain are sometimes dyed by substituting madder for half the quantity of the cochineal, following in general the same processes as for the grain crimson. Other proportions of madder may be used instead of half, according to the effect required.

The colour produced by Brazil is not so permanent on wool as cochineal, it is nevertheless employed. The cloth is boiled in a solution of alum, to which a fourth of its weight, or even less of tartar is added. A greater proportion of tartar inclines the colour too much to the scarlet or yellow hue.

The cloth thus impregnated should remain several days in a cool place; after which it is dyed by boiling gently in Brazil liquor. The colouring matter which is not deposited does not yield so fine a colour, the coarsest goods should therefore be passed through the bath first, and afterwards the finer ones. In this way a colour is obtained which stands the action of the air tolerably well.

Mr. Poerner directs 1 lb. of cloth prepared with 5 ounces of alum, and 1 ounce of tartar, to be boiled one hour in a bath containing 6 ounces of Brazil, and 6 ounces of alum. The cloth acquires a deep brick red. When steeped 24 hours in a cold solution of potash, it becomes a fine reddish crimson. By preparing the cloth with alum and tartar, Mr. Poerner observes that very good and useful colours may be obtained from Brazil, which are deeper and richer than those obtained on cloth prepared with alum, tartar, and solution of tin, or with tartar and solution of tin without alum. By varying the proportion of the ingredients, and still more by the action of potash and sal ammoniac, these shades of crimson may be greatly modified. Colours obtain-

ed from Brazil may thus be rendered tolerably permanent, yet they are not comparable in this respect with those obtained from cochineal or madder. A bloom is sometimes given to madder colours by passing them through a decoction of Brazil, but this slight tinge soon fades and perishes.

Mr. Gahlische gives a process, by which he pretends that fine and more permanent colours are obtained than by those in general use. He directs pure vinegar, or aceto-citric acid, or aqua regia, to be poured on Brazil rasped or chipped, till it is covered with the liquor; the mixture to be well shaken, then left to settle for 24 hours, after which it must be decanted, filtered, and kept for use. On the residuum, fresh water or vegetable acid is to be poured, and this to be repeated till all the colouring matter is extracted, when the wood will be found to be black. All these liquors are then to be mixed together for use.

The stuff having been prepared with a slight galling of sumac, or white galls, is slightly alumed. After rinsing, it is entered wet into a bath prepared as follows: Some of the acid solution of Brazil is diluted with water proportionate to the quantity of stuff, or the shade of colour to be given. When this is so hot that the hand will just bear it, solution of tin is poured in till it is of a fire colour: it is then stirred and the stuff entered. In half an hour it is taken out and washed. The remainder of the bath may be used for lighter shades, but those stuffs only must be galled that are for deep ones. The aceto-citric acid, as it is called by Berthollet, is a liquor of which Mr. Gahlische makes great use in dyeing under the name of vegetable acid spirit, which he prepares in the following manner: He takes any quantity of lemons; those of which the rind is rotten will do, remove the peel and the skin that adheres to it, and slices them into a vessel, which should not be made of wood. He sprinkles them with a quantity of good vinegar, and then squeezes out the liquor through a flannel by means of a press, and filters the expressed liquor through paper. It may be used with success in this state, but it is apt to grow mouldy and the acid is watery. In order therefore that it may keep, and not dilute the baths into which is put, he directs it to be purified and concentrated as follows: The liquor is to be exposed to the sun till a sediment forms and it becomes clear, it is then to be filtered and distilled on the sand bath. The receiver is to be changed when the liquor that drops becomes acid, and the distillation continued till oily streaks are perceptible in the neck of the retort.

The acid found in the receiver is to be kept for use.

On the foregoing process for obtaining aceto-citric acid, we shall observe that if the acid be used in its recent state, as expressed from the lemons, it is indeed a mixture of citric and acetous acid, but the rectified and concentrated spirit of Mr. Gahlische is, after all, nothing but distilled vinegar. Citric acid will not rise in distillation; it may be decomposed by heat, but cannot be driven on like acetous acid; this process of rectification is therefore a separation of the acid of the lemons from the vinegar they were sprinkled with, and proves the inutilty of one of the ingredients at least of this composition. Of the efficacy of galls in rendering the colouring matter of Brazil more permanent there can be little doubt, but it has a tendency to debase the colour, and it is with reason, that Mr. Gahlische observes that the galling should be employed only for the deeper shades.

Silk acquires from cochineal a colour which is distinguished from the false crimson obtained by means of Brazil.

Silk intended for cochineal crimson ought not to be boiled with more than 2elb. of soap to 100 of silk, as the yellow cast which silk has when imperfectly scoured is favourable to this colour. It is sometimes imparted to it

by a slight tinge of annotto, when white silk is to be dyed crimson.

When the silk is well cleaned from the soap by washing, it is soaked in a strong solution of alum, in which it is generally left all night, and next day is wrung, washed, and twice beetled at the river.

The bath is prepared as follows: Into the dyeing vessel, half, or two thirds filled with boiling water, from one to two ounces of pounded white galls are thrown in for every pound of silk. After boiling a few minutes, two ounces of cochineal or more, according to the strength and fulness of the shade required, are added for every pound of silk, and for every pound of cochineal, one ounce of tartar. When this is dissolved, an equal weight of the solution of tin is added; the ingredients are all well stirred, and the bath filled up with cold water. The proportion is generally about eight or ten quarts to every pound of silk. In this the silk is entered and worked till it appears quite uniform in colour; the fire is then increased, and the bath made to boil two hours, turning the silk from time to time. The fire is then withdrawn, and the silk left in the bath a few hours longer. It is then washed at the river, twice beetled, wrung, and dried. The solution of tin for this process ought to contain more tin than is used in the composition for scarlet, otherwise the colour is too bright, and not sufficiently full and deep. Macquer directs the solution to be made with one pound of nitric acid, two ounces of sal ammoniac, two ounces of tin, and twelve of water.

If the colour is to be faddened, the silk after washing is passed through a solution of sulphate of iron, more or less strong, according to the shade required: if the crimson should have a tinge of yellow, a greater or less proportion of the decoction of fustic must be added to the solution.

White galls are preferred, because the black or blue galls debase the colour of the cochineal; and even white, when used in too great a quantity, dull the crimson very much. Macquer pretends that the galls serve only to increase the weight of the silk; their general effect, however, is that of giving greater permanency to the colours, and in crimsons of the deeper shades their use is indispensable.

The quantity of solution of tin employed in the foregoing process is very small. If used in the bath in the same proportion as for dyeing wool scarlet, the silk would lose its lustre, and acquire but a faint colour. Macquer and Scheffer have however each published processes for dyeing silk rose or poppy colour, which differ only in a few particulars from the ordinary mode of dyeing scarlet, the solution of tin being employed cold to avoid its strong action on the silk.

In the process which Macquer published in 1768, the solution is prepared by adding three ounces of tin by little at a time, to a mixture of four ounces of nitric, and two of muriatic acids. When the solution is finished, 6 lbs. of silk that have already had a slight ground of annotto, are immersed, and remain in it half an hour. It is then wrung and washed till it no longer renders the water turbid. It is dyed with four ounces of cochineal, and one ounce of tartar, for every pound of silk. These are boiled up in water, and afterward cooled down till the hand can bear the heat. The silk is then entered, and the fire increased; after boiling one minute it is withdrawn and washed. By this process the silk has acquired an increase of one fourth of its weight. Its colour resists soap, and is much more permanent than that which Carthamus affords.

In 1751, Scheffer published a description of the following process. He dissolved one ounce of tin in a mixture of

four ounces of nitric acid, and one of common salt. The solution was diluted with twice its quantity of water, and the silk steeped in it 24 hours. When withdrawn it was washed till the water no longer appeared milky, and dyed with four fifths of its weight of cochineal in a small quantity of water. The bath retains a considerable portion of colouring matter which may serve for dyeing silk a lighter shade, or even for dyeing crimson by the ordinary process. It may be used also for dyeing wool.

Scheffer describes the following varieties of his process for obtaining different shades. If the silk be wrung out of the solution of tin, left all night in a cold solution of one ounce of alum in a quart of water, wrung, dried, washed, and afterwards dyed with cochineal, it will take only a pale poppy colour. If the silk be steeped twelve hours in the solution of tin diluted with eight parts of water, and then left all night in the solution of alum, washed, dried, and passed through two baths of cochineal as before, adding to the second bath a little sulphuric acid, the colour will be a fine poppy red.

In the experiments made by Berthollet on this subject, the solution of tin, which answered best for dyeing silk, is that which he has directed for the scarlet dye, and is made by dissolving slowly in one pound of nitric acid, two ounces of tin, and two ounces of sal ammoniac; the salt to be dissolved first, and the tin added afterwards in small portions at a time, stirring it frequently to incorporate the solution fully. When finished and decanted from the black sediment which is deposited, it is diluted with one fourth of its weight of water. The nitric acid employed should be of the strength of 30° of the hydrometer of Beaumé, which corresponds with a specific gravity of about 1.26.

Solutions containing a greater proportion of tin gave deeper shades. The colour obtained by the above, was a fine cherry colour sufficiently bright.

Brazil wood is used for dyeing silk what is called *falfe* crimson, to distinguish it from that produced by means of cochineal, or *grain* crimson, which is much more permanent. Vinegar is used to distinguish the true colour from the false, but this proof is fallacious, since the Brazil crimson dyed with the solution of tin, resists the action of vinegar like cochineal, though that dyed with alum does not.

Silk intended for this crimson, should be boiled with soap in the proportion of twenty pounds to a hundred of silk, and afterwards alumed. Less alum is required for this than for grain crimson. After rinsing in the river, it is passed through a bath more or less charged with the decoction of Brazil according to the shade required. If water, free from earthy salts, be used, the colour is too red for crimson; the proper hue is given to it by passing the silk through a slight alkaline solution, or by adding a little alkali to the bath.

Working the silk in hard water till it has acquired the proper shade, will answer the same purpose.

Logwood liquor may be added to the Brazil, to deepen the shade of crimson, and a little alkali used with it also when the shade desired requires it.

There is the same objection to the use of the solution of tin in dyeing silk crimson with Brazil as with cochineal; silk has not that powerful attraction for the colouring matter combined with tin that wool has; the greater part therefore separates and contracts no union with the stuff. Bergman, however, remarks that the colours imparted to silk by different dye woods, may be much improved by steeping the silk in a cold solution of tin. A strong decoction of Brazil, says he, gives to yellow silk prepared in this way a scarlet colour inferior indeed to that of cochineal, but finer and more permanent than if it be steeped in alum only, and as

capable of standing the proof by vinegar as crimson or poppy in grain. Mr. Guldiche describes a process, in which he uses solution of tin in the bath to give silk a fire colour. He directs the silk to be galled with a solution of galls in white wine, asserting that an astringent solution thus made preserves the brightness required in silks much better than one prepared with water. With this solution he mixes water till it has acquired a yellow colour, and impregnates the silk well with it, leaving it to steep cold for several hours. He then presses out the liquor strongly, but without rinsing the silk which he dries, and afterwards soaks for twelve hours in a solution of alum, containing four ounces for every pound of silk. The silk taken out of the alum water is wrung, and entered wet into a bath of Brazil, after adding to it an ounce of solution of tin. The remainder of the bath may be exhausted for lighter shades. If the colour be required more approaching to orange, the silk is not to be galled, but to be alumed cold with two ounces of alum to the pound of silk, after which it must be dyed orange with annotto, without boiling, and before it dries dyed in the Brazil bath. The author confesses that these colours, particularly the latter, are not very permanent. For rose colours he omits the galling, and for the aluming uses only two ounces of alum to the pound of silk. For light shades he recommends the solution of alum to be decanted from the sediment that may have been deposited, and prefers dyeing them cold, using a bath richer in colour. The silk is to be taken out as soon as it has acquired the proper tint, and the bath may be exhausted for other shades. With these precautions he assures us, that fine colours of tolerable permanency may be obtained.

The crimson imparted to cotton or linen by cochineal and Brazil, has little solidity, and is on that account but little used, more especially as madder imparts to these substances, properly prepared, one of the most beautiful and permanent colours which the art of dyeing can produce.

As this however is not the place in which to enter into a detail of the operations of the Turkey or Adrianople red, which we purpose to treat at large under another head, we shall give some account of the processes that have been proposed and practised with more or less success for producing a fine crimson colour upon cotton by means of cochineal and Brazil.

Mr. Poerner has made many experiments with different mordants, as alum, solution of tin, sal ammoniac, potash &c. for dyeing cotton with Brazil, used either in the bath or in the preparation of the cotton. He could not produce a colour, however, that would stand washing with soap, though some would stand the action of the air and washing with simple water very well. He recommends cotton thus dyed, to be dried in the shade.

Mr. Berthollet received from Mr. Brown the following process for dyeing cotton a crimson colour, which is used by some manufacturers.

A solution of tin is prepared in the proportion of nitric acid two pounds, muriatic acid one pound, tin eight ounces and water one pound. The liquids being well mixed, the tin is added by little and little. For a piece of cotton velvet weighing fifteen or sixteen pounds, a bath is prepared consisting of boiling water four parts, strong decoctions of galls two parts. Having raked up the bath, the piece is entered and worked for half an hour, and left to soak two hours, when it is taken out and left to drain. Another bath prepared with three buckets of boiling water, and one of decoction of Brazil wood, also boiling, is to be raked up and the piece worked in it an hour. This bath is to be thrown away, the vessel washed out and then filled with a pure decoction

of the wood, in which the piece is to be worked half an hour, and then raised on the winch. A bath of very clear river water, with a quart of solution of tin, being prepared and raised, the piece is to be worked in it a quarter of an hour. It is then wound on the winch, and let on the vessel containing the decoction of Brazil, one sixteenth of which is to be taken out and replaced by an equal quantity of boiling decoction. This being raked, the piece is worked in it half an hour, wound on the winch and carried back to the vessel containing the solution of tin. These operations are performed alternately six or eight times, observing each time to take out a sixteenth of the bath of Brazil wood, and replace it with an equal quantity of boiling decoction of the same wood, to rake the bath of composition each time, and to finish the dyeing with the latter. The piece is to be washed in the river, and dried in a dark place.

With the aluminous mordant cotton takes a full and tolerably bright crimson from Brazil, the permanency of which is considerably increased by previously subjecting the cloth to the operation of galling. The printer's mordant prepared with acetite of lead and alum, is best for this purpose. When used diluted, the shades of crimson and rose colour are very delicate, but so fugacious as not to support the action of the sun and air unimpaired a single day. Sumac used in the bath along with Brazil contributes greatly to its fixity; the stronger shades dyed this way support the action of the air tolerably well, and have greatly the appearance of a madder red.

Cochineal is little used for dyeing cotton and linen, since the colour is much less permanent than that obtained from madder. Scheffer however has described a process which may be employed. The cotton is to be steeped 24 hours in a cold solution of tin, it is then wrung, washed, and boiled a quarter of an hour with four-sixths of its weight of cochineal. It takes a light red, and resists the sun and air for a time, but not soap. Little use appears to have been made of this process of Scheffer, though it is probable that Dr. Berkenhout availed himself of it some years afterwards, when he pretended to have discovered the means of dyeing scarlet crimson, and other colours upon cotton and linen; and though his process was not materially different from Scheffer's, nor in any respect preferable, he obtained 5000 *l.* from the British government, as a reward for making it public.

As it excited considerable interest and some contention at the time, we shall present our readers with the following detail of the process, as it was communicated by order of the lords of the treasury to the company of dyers in the city of London, Aug. 16th. 1779. *viz*

"Cotton or linen, either in yarn or piece, should be perfectly wet with hot water, and then wrung out, as is the common practice.

"This being done, it must be perfectly soaked in a solution of tin diluted with an equal quantity of clear soft water.

"The cotton or linen being so far prepared, must be wrung out, but not forcibly; it is then to be nearly dried, lying horizontally upon a hurdle with a double linen sheet between them, and covered with the same.

"The solution of tin being for scarlet, must be made of vitriolic acid, and rest of aquafortis; but for crimson, aqua is more to be used, and the alum is to be given after it comes out of the tin, by a small quantity of sal ammoniac and sulphuric acid; the bath is warm water, but this is not to be used in red or crimson yarn.

"The bath being put for the scarlet or crimson is simply

cochineal in water no hotter than the hand will bear, and as vegetable matter receives only the small particles of the colour from the nature of its pores, two ounces to a pound of the materials dyed may be necessary: but cotton or linen fresh prepared, will draw from the same vat, treated as before, all the inferior shades from scarlet and crimson, and if any colour still remains in the vat, it may be taken out entirely, by wool prepared in the usual manner.

"The same preparation of tin serves for the green and yellows, with the same materials only that are employed by dyers, except the best yellow, which is produced from turmeric.

"It is necessary to observe, that after the preparation has been made use of for scarlet or crimson, the residue continues sufficiently strong for greens or yellows, even after it has been kept a considerable time.

"N. B. To make the best solution of tin with nitrous acid, it is necessary to have the strong fuming spirit, to which an equal quantity of the purest river water must be added, and the proportions of the following ingredients are to the weight of spirits $\frac{1}{2}$ sal ammoniac, $\frac{1}{2}$ refined nitre, dissolved by little at a time. In this aqua regia, dissolve $\frac{1}{2}$ of granulated tin also by small quantities, to prevent too great an ebullition which would weaken the solution considerably. The ingredients and proportions are the same when a solution is to be made with aquafortis, but that spirit in general will not bear any water when a perfect solution is intended."

Besides the fugitive nature of the colour dyed by the above process, it was found that the texture of the cloth was considerably injured, and it was soon laid aside, or rather was never adopted. If, notwithstanding the want of sufficient permanency, however, the colour which cochineal affords, should still be required; the best way of producing it, according to Dr. Bancroft, is to soak the cotton (previously moistened) about half an hour in a diluted solution of murio-sulphate of tin; then wring or press out the superfluous part of the solution, and plunge the cotton into water, in which as much, or nearly as much clean potash has been dissolved as will neutralize the acid still adhering to the cotton, so as to precipitate the oxyd of tin, and cause it to be more copiously deposited or fixed in the cloth, which being afterwards rinsed in clean water may be dyed with cochineal in the usual way. A full bright colour may be given to cotton in this way, which will bear a few slight washings with soap, and a considerable degree of exposure to air. The murio-sulphate of tin, on which Dr. Bancroft lays great stress, as well for the above process as for dyeing silk crimson, is prepared by dissolving 14 ounces of tin in a mixture of two pounds of oil of vitriol with three of muriatic acid. The muriatic acid should be first poured upon the granulated tin in a large glass vessel, and the oil of vitriol afterwards added slowly; and these acids mixed should be left to saturate themselves with tin, which they will do in time without artificial heat; but the solution will be rapidly promoted by a sand heat.

Under the head of cochineal we have given a short account of its use in calico-printing in dyeing crimson, to which we must refer our readers as well as to the article COLOURS for other details connected with the subject. The colours produced from madder with the aluminous mordant in the ordinary processes of this art, strictly speaking, belong not to the class of crimson, yet by repeated branning, boiling in soap or alkalis, the yellow or fawn coloured principle which this root contains, may be nearly extracted, and tolerable crimsons obtained. The addition of a small quantity of solution of copper to the acetite of alumine, gives the colour

colour a crimson hue of no great lustre, but very permanent.

The following process by Mr. Grouse, affords a colour of less intensity indeed, and solidity, but scarcely inferior in beauty, to the Adrianople red.

Prepare a mordant by dissolving 4 lbs. of acetite of lead, and 4 lbs. of alum in a gallon of pure water, and after decanting the supernatant clear solution from the precipitate which forms, thicken it with gum to the consistency required. If the work requires the mordant to be *lightened*, add a little infusion of cochineal till it is sufficiently tinged to enable the printer to observe the progress of his work. Keep the goods from four to six days after printing, in a warm place, to facilitate the liberation of the acid; rinse them five minutes in a copper of water at 120°, with two good spade-fulls of cow dung, after which wash and rinse them in clean water several hours, alternately winching, washing, and suffering them to steep in the river. Lastly, winch five minutes in a clean hot water copper at 120°, and after rinsing and washing again in the river, dye them as follows. Into a dye copper of 300 gallons capacity three parts filled with clean water, free from all accidental impurities, and not discoloured either by rain or floods, put 20 lbs. of the best crop madder, and 60 lbs. of good sweet bran. Mix well, and bring them up quickly to a boil, and keep them in a state of ebullition 20 minutes. Add cold water sufficient to take the copper off the boil, then enter two pieces, winching them briskly and keeping them down with the copper stick the whole time they are in. Bring the copper up to a boil again, and in 8 or 10 minutes, according as the shade required, the goods will have acquired their full colour. Enter two more pieces after these are withdrawn, and keep them in a few minutes longer; they will be scarcely inferior to the former, but as the copper becomes exhausted, every succeeding set will acquire less colouring matter than the preceding, and if the operation be continued upon several sets without refreshing the copper, the last will acquire only a pale but delicate rose colour. If the whole are required to be full deep colours, the copper must be supplied with a regular charge of bran and madder after every second set, but to exhaust the bath fully, and proceed with due regard to economy, the strong colours should be dyed first, and the pale and more delicate shades afterwards.

Wash them well after dyeing, and bran them at a boil. The colour improves much by this last operation, which may be repeated on the stronger shades till the colour has acquired its proper hue, and the whites are good. See **MADDER**.

CRIMSON-Grass Vetch, in *Botany*. See **LATHYRUS Nissolia**.

CRINAN LOCH, in *Geography*, is a branch from the fount of Jura, in Argyleshire, in Scotland, connecting with Craigness loch, and terminating at the west end of the Crinan canal; the town of Glasre is situate not far from its southern shore.

CRINAN Canal, a short canal of very large dimensions, for the passage of ships between loch Crinan and loch Fine, when coming or going northward to or from the Clyde river, by which a very circuitous navigation round the mall of Cantire is avoided. See **CANAL**.

CRINED, in *Heraldry*, a term denoting that the hair of the head of a man or woman, or the mane of a horse, unicorn, &c. is represented.

CRINGLE, in *Rural Economy*, a term which is provincially applied to signify a withe or twilled wooden rope which is employed in fastening a gate, from whence to

“cringle up” implies to fasten with a wooden rope or withe.

CRINGLES, in *Sail-making*, small holes formed on the bolt-ropes of sails by intertwisting the strand of a rope alternately round itself and through the strands of the bolt-rope, till it assumes the shape of a ring. To the cringles the end of a rope is fastened, to haul the sail up to the yard, &c. They should be made of the strands of new bolt-rope, half an inch smaller than the bolt-rope on the sail.

CRINIÈRE, Fr. The mane of a horse, literally speaking. This name is also given to a tuft of horse hair fixed in the crest of a dragoon's helmet, and flowing or waving down to the lower part of the same, on the side thereof, like a garland.

CRINITA, in *Botany*, capensis; Hoult. See **PAVETTA castra**.

CRINITUS applies to any plant, or part of a plant, that resembles a tuft or head of hair, as the inflorescence of *Hedysarum crinitum* of Linæus, and *Pbleum crinitum* of Schreber. It differs from *comosus* in being more precisely and necessarily composed of hair or bristles, and not restricted to a flowing or pendulous form or posture. In some cases it is equivalent to *capillatus*. The roots of *Mrum abumantium* and *Trichochin bulbosum* are *radices capillate, vel crinitæ*, being each crowned with a dense tuft of upright hairs or bristles, originating from the fibres of decayed leaves or leaf-stalks, and serving to protect the root, or young plant, from cold, or other injuries, in a remarkable manner. S.

CRINITZ, in *Geography*, a town of Germany, in the circle of Lower Saxony, and territory of Erzgebirg; 6 miles S. of Zwickau.

CRINODENDRUM, in *Botany*, (from *κρινος*, a lily, and *δενδρον*, a tree) Schreb. Gen. 1114. Willd. 1267. (Patagua; Enc.) Class and order, *monadelphica decandria*. Nat. Ord. *Undetermined*, Juss. 431.

Gen. Ch. *Cal.* none. *Cor.* bell-shaped; petals six, oblong, erect, spreading at the top. *Stam.* Filaments ten, united at the base into a tube; anthers egg-shaped, erect. *Pist.* Germ superior, egg-shaped; style simple, awl shaped, a little longer than the stamens. *Peric.* Capsule coriaceous, obtusely three-cornered, one-celled, opening elastically at the top with three valves. *Seeds* three, roundish, nearly the size of a pea.

Ess. Ch. Calyx none. Corolla bell-shaped. Petals six. Capsule with three seeds, one-celled, trigonous, opening classically at the top.

Sp. C. *patagua*. Mart. Poir. Willd. Molin. Chil. 179. Cavan. Dif. 5. 300. tab. 158. fig. 1. A superb evergreen tree, with a trunk often seven feet in diameter. *Leaves* bright green, opposite, lanceolate, acute, serrated, without stipules; petioles short. *Flowers* solitary, axillary, peduncled, smelling like a lily. A native of Chili. Jussieu suspected that the capsules sent to Europe by Dombey, under the name of Patagua, might belong to a plant of this genus; but Ruiz and Pavon assert that Dombey's plant, which produces the true Patagua of Chili, constitutes a distinct genus, which they call *Tricuspidaria*. The trivial name given to the present plant is therefore erroneous and tends to mislead. See **TRICUSPIDARIA**.

CRINONES, from *crinis*, hair, in *Medicine*, a sort of worms, sometimes found under the skin, in children; resembling short thick hairs, or bristles.

They are called *dracunculæ*, and *comedones*, from the Latin *comedere*, to eat; from their preying upon the substance of the

the child, or consuming its nourishment. See DRÆVEN-
CILI.

The common way of getting out these worms is by the point of a needle; and to prevent their forming there again, the usual custom is to wash the parts with wine or vinegar, with alum, nitre, or common salt, or with a strong lixivium of oak ashes, and afterwards anointing them with an ointment of the common kind, used for scorbutic eruptions, with a small mixture of quicksilver.

CRINONIA, a kind of cap, worn by the emperors of Constantinople on solemn occasions.

CRINUM, in *Botany*, (*crinum*; Theophr. a name given by the Greeks to the lily, and some other plants with showy flowers.) Linn. Gen. 425. Schreb. 533. Willd. 618. Clais and order, *hexandria monogynia*. Nat. Ord. *Spathaceæ*, Linn. *Narcissi*, Juss.

Gen. Ch. *Cal.* Involucre spathe-shaped, of two or more oblong leaves, umbelliferous, reflexed after it has opened. *Cor.* monopetalous, funnel-shaped; tube oblong, cylindrical; border half six-cleft; segments lanceolate-linear, obtuse, channelled, reflexed; three alternate ones, in most species, distinguished by a hooked appendicle. *Stam.* Filaments six, awl-shaped, the length of the border and inserted in its base, converging; anthers oblong, linear, rising upwards, incumbent. *Pist.* Germ inferior; style filiform, the length of the flower; stigma simple, or three-cleft. *Peric.* Capsule somewhat egg-shaped, three-celled. *Seeds* numerous.

Ess. Ch. Corolla funnel-shaped, half six-cleft; tube filiform; border spreading, recurved; segments lanceolate-linear, channelled. Filaments inserted in the base of the border, distinct. Germ inferior.

Obs. It differs from *pancratium* in the want of a nectary. The *crinum* of Gærtner and La Marck has a superior germ, and is formed for the *crinum Africanum* of the Species Plantarum, which has that character, and on that account has been made by Schrader a distinct genus under the name of *Agapanthus*. La Marck, however, has included in his *crinum*, *C. americanum* and *C. tenellum*, because he thinks their germ is not decidedly inferior. Such as are so he has removed to *anaryllis*.

Sp. 1. *C. asiaticum*. Linn. Sp. Pl. 2. Mart. 1. Willd. 1. Lour. Cochinch. 197. "Leaves keeled." Linn. "Leaves linear, acuminate, keeled; flowers sessile; tube longer than the border; spathe two-leaved." Willd. *Root* solid, top-shaped, surmounted with long branching fibres. *Stem* short, thick, coated, white, single. *Leaves* three feet long, three inches broad, subulate-linear, erect, striated, thick, imbricated. *Scapes* axillary, cylindrical, the length of the leaves. *Flowers* white, large, in a single flat umbel; common involucre oblong; segments of the corolla equal, not hooked; stamens distant. *Capsule* roundish, irregularly lobed. Lour. There has been some confusion with respect to this species. Osbeck, a pupil of Linnæus, observed it in 1751, embellishing the sandy shores of the island of Java; and in the year following, brought into Europe, not only bulbs preserved in sand, but also the plant itself in a flower-pot, which arrived perfectly alive in Sweden. About the same time Mr. Miller received from Panama and Carthæna two distinct plants, the smaller of which he supposed not to differ from the Asiatic species, and accordingly figured it under that name in his coloured plates. Linnæus, misled by Miller, quoted that figure as really belonging to his *C. asiaticum*. In this error he was probably confirmed by observing in Miller's figure no appearance of a hooked appendicle at the summit of the

alternate segments of the corolla; and hence seems to have considered that appendicle itself as a sufficient specific distinction of the larger American plant. We apprehend, however, that it was left out in Miller's plate by the negligence of the engraver; for we have now before us a dried specimen of a plant cultivated many years since by Mr. Salisbury at Chapel Allerton, under the name of *crinum asiaticum*, in which that particular character is distinctly visible. The real *C. asiaticum* does not appear ever to have been seen by Miller; nor was it known at Kew when the *Hortus Kewensis* was published; but the author of the specific characters in that work had discovered Miller's mistake, and removed the reference to the new species *crubifens*, *C. americanum* β of Linnæus. Gærtner quotes the *C. asiaticum* of Linnæus, as his *bulbine asiatica*; Mr. Salisbury, however, assures us that the bulbine is certainly a plant not in our collections, and that he is yet ignorant what it is, but that if he should guess at any one in particular, it would be the *cæpa sylvestris* of Rumphius, quoted by L'Heritier, as a synonym of his *crinum nervosum*. See *Parad. Lond.* 52. *C. americanum*. Linn. Sp. Pl. 3. Mart. 2. Willd. 2. Hort. Kew. 413. (*Lilio-asphodelus americanus maximus*; *Comm. Rar.* 14. tab. 14. Dill. *Elth.* 194. tab. 161. fig. 195.) "Leaves oblong-lanceolate, quite smooth at the edge, contracted and hooked at the end; flowers pedicelled; tube shorter than the border." *Scape* a foot and half high, the thickness of a finger, slightly compressed, coming out from the root on one side of the leaves. *Leaves* two feet long or more, three inches broad, furrowed on the upper surface, keeled on the lower, smooth, stiff, light green, slightly undulated at the edge, thickish, sharp-pointed, punctured with numerous and rather large pores. *Flowers* milk-white, opening successively, and each lasting only one or two days; tube about two inches long; segments of the border keeled; stamens long, bending in, white at the bottom, purple at the top; style shorter than the stamens, of a deeper purple colour. Some very slender threads adhere to the involucre, and to the pedicels of the flowers. A native of South America; cultivated at Eltham by Dr. Sherard in 1732. 3. *C. erubescens*. Hort. Kew. 413. Mart. 3. Willd. 3. (*C. americanum* β ; Linn. Sp. Pl. *C. asiaticum*; Mill. tab. 110. *Lilio-asphodelus minor*; *Com. Rar.* tab. 15.) "Leaves lanceolate, cartilaginously-crenulate, drawn out and unfolded at the end; flowers sessile; tube longer than the border." *Scape* rising from the root at the outside of the leaves. *Flowers* eight or ten, forming an umbel, closely joined at their base, but spreading above; petals delicate, not continuing in beauty more than four or five days. A native of the Spanish West Indies. 4. *C. brazeatum*. Willd. 4. "Leaves oblong-lanceolate, attenuated at the base, cartilaginous and smooth at the edges, somewhat callous at the tip; flowers pedicelled; tube shorter than the border; spathes numerous, longer than the tube." *Flowers* white; segments of the border narrow, reflexed, channelled, hooked at the tip; bractes or spathes oblong-lanceolate. Described by Willdenow from a living plant; native country unknown. 5. *C. nervosum*. Mart. 6. Willd. 5. L'Herit. fert. angl. 8. (*Cæpa sylvestris*; Rumph. Amb. 6. p. 160. tab. 70. fig. 1.) "Leaves roundish, nerved; filaments dilated at the base." *Leaves* cordate-rounded, entire, acuminate, with concentric nerves. *Scape* many-flowered, with a many-leaved involucre. *Flowers* on rather long peduncles; tube of the corolla filiform; segments of the border lanceolate, acute, spreading; filaments shorter than the segments of the corolla, straight, not declining. A native of the Philippine islands, observed by Monf. Poivre.

CRINUM africanum; Linn. See *AGAPANTHUS umbellatus*.

CRINUM angustifolium; Linn. jun. See *CYRTANTHUS angustifolius*.

CRINUM caspium; Pall. See *AMARYLLIS caspia*.

CRINUM falcatum; Jacq. See *AMARYLLIS falcata*.

CRINUM latifolium; Linn. See *AMARYLLIS latifolia*.

CRINUM lineare; Linn. jun. See *AMARYLLIS linearis*.

CRINUM longifolium; Thunb. See *AMARYLLIS longifolia*.

CRINUM obliquum; Linn. jun. See *CYRTANTHUS obliquus*.

CRINUM speciosum; Linn. jun. See *AMARYLLIS purpurea*.

CRINUM tenellum; Linn. jun. See *STRUMARIA filifolia*.

CRINUM zeylanicum; Muir. See *AMARYLLIS zeylanica*, under which genus it was originally placed by Linnæus. Mr. Gawler Kerr declares (*Bot. Mag.* 923.*) that after a diligent research, he is assured of the specific identity of the Indian *amaryllis zeylanica*, and the African *ornata*, and has published the *crinum giganteum* of the Botanical Repository, tab. 169, as an obvious variety. Mr. Salisbury thinks the *A. ornata* and *crinum giganteum* distinct, and is inclined to refer both to the genus *crinum*. His *C. yuccæ-florum*, figured in *Paradisus Londinensis*, Pl. 52, is, as he himself acknowledges, so similar to *A. ornata*, cultivated in the stoves about London, that he cannot find a satisfactory specific distinction. It differs so much, however, in the structure of its anthers, that he thinks it safest for the present to separate it. He says that these plants and the *C. longifolius* of Thunbery, since removed to *amaryllis*, may be distinguished from that genus by the herb alone, as well as by the fruit. See *Par. Lond.* 52.

CRINUM, in *Gardening*, comprehends plants of the flowery tuberous and bulbous-rooted perennial kinds; of which the sorts mostly cultivated are, the keel-leaved Asiatic *crinum*, (*C. asiaticum*); the great American *crinum*, (*C. americanum*); and the small American *crinum*, or *asphodel lily*, (*C. crubescens*).

Method of Culture.—All these three sorts are capable of being increased, by planting the off-sets of their roots in pots filled with good fresh earth, plunging them in the bark-bed of the stove, where they should be continued until they begin to show flowers. After this they may be removed, when necessary, to the shelves or other parts of the hot-house where they must be kept.

It is necessary that the roots of all the different sorts should be shifted every two years, at the period when the stems decay, in order to separate the off-sets for the purpose of increase, and to refresh the plants with fresh mould.

The succulent stalks and beautiful flowers of these plants afford a good effect among other stove plants, when properly placed in mixture with them.

CRIO, CAPE, in *Geography*, a cape on the W. coast of Asiatic Turkey. N. lat. 36° 40'. E. long. 27° 8'.—Also, a cape of the island of Candia; 7 miles S.W. of Canea.

CRIQUE, Fr. in *Fortification*, small ditches, which are made in different parts of the ground for the purpose of inundating the country in the environs of a place, to render the enemy's approach to it either difficult or impracticable.

CRIQUETOT LESNEVAL, in *Geography*, a small town of France, in the department of the Lower Seine, 9 miles south of Fecamp. It is the chief place of a canton in the district of Havre, and contains 1650 inhabitants. The canton has 26 communes, upon a territorial extent of 140 kilometres, with a population of 14,748 individuals.

CRISCUOLO, GIO FILIPPO, and GIO ANGILOLO, in

Biography, two brothers, natives of Gaeta, who enjoyed considerable reputation at Naples in the 16th century, as historical painters. Gio Angiolo was the scholar of Marco di Siena. Gio Filippo was a disciple of Andrea da Salerno, and afterwards travelled to Rome, where he studied the compositions of Raffaele with great profit. The works of these two artists are described by Dominici in his lives of the Neapolitan painters. Gio Angiolo died in 1572; Gio Filippo survived him 12 years, and died at the age of 75. Lanzi. *Storia Pitt.*

CRISIS of diseases, a sudden change for the better, in the symptoms of acute diseases, preceded by a considerable disturbance of the functions, and accompanied by some evacuation.

This appears to be the sense in which the term was generally understood by Hippocrates and Galen, and the other ancient physicians, who adopted the doctrine of *crises*. It is, however, not only a sudden alteration towards recovery, which they have denominated a crisis; but a rapid change for the worse, or to death itself, also received the same denomination; but the epithet *bad* was in that case added. And those disturbances, which only make some considerable change, without entirely removing the disease, or which are followed by an exacerbation or return of the symptoms, were called *imperfect crises*. The word *crisis*, *κρίσις*, literally signifies *judgment*, from *κρίνω*, *I judge*; and Galen is of opinion that the term was originally the contrivance of vulgar and uninformed persons, rather than of physicians. The change being always preceded by great disturbance of the body, and alarming symptoms, the friends and attendants, affrighted by the violence of the disease, pronounced that a decisive *judgment*, as to the death or recovery of the patient, might speedily be formed; hence they called the change of the symptoms themselves, the *crisis*, or *judgment*. The disturbances, the violent symptoms, the discharges, which ensue, were hence also denominated *critical discharges*, *critical perturbations*, and *critical symptoms*.

It is a curious fact in pathology, that the vital powers, after being worn down, and apparently almost exhausted, by the continued violence, or successive exacerbations, of fever, often suddenly and spontaneously become recruited, the alarming symptoms disappearing, and leaving the patient with little more complaint than extreme general weakness. This sort of change takes place most commonly in continued fevers, more especially in those which are violent from the beginning. For these crises happen most frequently within the first ten or eleven days of the disease, and if they occur at a later period than the fourteenth, are less decisively beneficial, and less distinctly marked. Crises, indeed, do not happen so frequently in this climate, or in modern times, as anciently; in so much that it has been disputed whether the maxims, which have been handed down to us, have any application to the diseases which we now observe. It is probable, that the frequent vicissitudes of our climate, the greater activity of our practice, and the less regular mode of life among the moderns, is the cause of the comparative rarity of the occurrence of violent crises: they occur, nevertheless, sufficiently often, to render the study of them important, especially with a view to the prognosis of the event.

The doctrine of crises, although originating, no doubt, in the careful observation of facts, for which the physicians of the Hippocratic school were remarkably distinguished, was nevertheless much connected with their speculative opinions respecting the humoral pathology; and especially with the doctrine of concoction. (See *CONCOCTION*.) They observed that those sudden or critical changes were always preceded

preceded or accompanied by some evacuation; as by copious sweat, or a great deposition of sediment in the urine, or by a discharge from the bowels, by hæmorrhages, &c.; in pulmonary fevers, by a free and copious expectoration; and so on. Hence they were led to suppose, that the disease was the effect of the presence of some morbid matter in the humours, and was itself an effort of the constitution to expel this matter, after due concoction, from the body. These discharges were, therefore, considered as proofs at once of the existence of morbid humours, and of the successful struggle of the system in expelling them; and the violent perturbations which preceded the expulsion, were deemed to be signs of the conflict between the powers of the constitution, struggling to expel the humours, and the noxious influence of these humours upon the constitution. The hypothesis was plausible, and has been the ground-work of the reasoning of medical writers, from the time of Hippocrates, down to the age of Hoffmann and Cullen; and it is still the favourite theme with the ill-informed part of the profession, and with the public at large. But the distinguished professors, just mentioned, taught us to attend to the operations and excitability of the nervous or living power in the solids, by the action of which the fluids are principally modified in their qualities. Thus in respect to the progress of common inflammation, which is the prototype of the humoral theory, the swelling, tension, pain, &c. were considered by those pathologists as the effect of obstruction, occasioned by the presence of morbid humours: and when the inflammation was not gradually cured by resolution, but went on, it was only finally removed by a discharge of the morbid humours, when concocted in the shape of *pus*. Now the modern doctrine, which is deduced from a more complete generalization of the facts, teaches us that these phenomena are not the result of morbid humours circulating in the vessels; but that the morbid humours are the result of certain disordered actions of the vessels, by which the secretions of those vessels are altered. In the healthy condition of the body, there is no urine, no bile, no saliva, in the blood; these fluids are produced in the kidneys, the liver, and the salivary glands, by the peculiar action of the vessels of those organs, which gives new combinations to the elementary parts of the blood. This action is called *secretion*. Similar actions in inflamed parts produce the variety of humours which appear in the progress of the inflammation; as particularly obvious in the inflammation of surfaces. Take *Coryza* for example. The natural secretion of the membranes lining the nose is a simple moisture. But if an inflammatory action is excited in these membranes, the vessels, at the commencement, either do not secrete at all, or they pour out a thin and acrid humour, which the ancients call *crude*; as the inflammation goes on, the action of the vessels changes, and they produce a thick, whitish mucus; and when the inflammatory action is beginning to subside, the secretion from the blood is again altered, it has the appearance of *pus*, and is said by the humoralists to be concocted. The inflammation from this time declines and ceases. In this case there is no morbid humour in the blood of the inflamed membrane; but the action of the vessels being changed, in various progressive degrees, by an external cause, *viz.* cold, they produce new combinations in the blood, which circulates through them, and at once generate and eject the morbid humour. The morbid humour is not a cause, therefore, but an effect, and a sign of a morbid condition of the living power, and the consequent morbid action of the part.

And thus it is, also, with respect to those discharges which are deemed *critical* in the more general deranged action of fevers. It will not be difficult to shew, as we enu-

merate them, that they are oftener the effects of a favourable change in the system, than the causes of it. A profuse sweat is a symptom which very commonly attends those sudden changes from fever to health. It accompanies the crisis in intermittent fevers, and frequently that of the synocha, or inflammatory fever: indeed, continued fever in general is seldom terminated favourably, without some degree of moisture appearing on the skin. But physicians were long misled into a most pernicious practice, (the employment of the hot regimen, and alexipharmics,) by the conclusion, that the solution of the fever was to be attributed to the flow of sweat, and that could this discharge by any means be produced, it would always prove equally beneficial. But a proof of their error, and also of the position that such salutary sweats were the result of a favourable change in the constitution, is this, that sweats, forced by artificial means, never affect the solution of the fever, but most frequently increase its violence, prolong its duration, and, by greatly debilitating the patient, endanger his life. Nor is every spontaneous sweat salutary: unless it be universal and thin, it is seldom beneficial.

The same observation may be made as to the deposition of the sediment in the urine, which commonly appears at the crisis, and was deemed a proof of the concoction being completed. Now this deposited matter is not in the blood, but secreted by the kidneys, and it exists in some proportion almost constantly in the urine of persons in health. Its production in larger quantity is much connected with a soft and moist state of the skin, and invariably accompanies much sweating, from whatever cause produced. It occurs with the spontaneous sweats of fever, whether critical or even prejudicial; it is found after all night sweats, as from those of hectic fever, where no relief is brought by it, and even when there is no fever at all; and, farther, it may be produced in any one at pleasure in a state of health, by promoting the perspiration by small doses of tartar emetic or Dover's powder. (See Wilson on Febrile Diseases, vol. i. p. 398.) Therefore all that can be inferred from the appearance of the lateritious sediment in the urine in fevers is, that the relaxation of the skin has taken place, and its secretion is restored; or in other words, where the deposition is spontaneous, that it is the consequence of a favourable change in the constitution. The changes in the urine, however, although affording no particular indication of cure, merit our attention, as they sometimes anticipate the other phenomena which mark a solution of the fever.

Among the critical discharges, diarrhœa occurs less frequently than the two preceding ones: Hoffmann, however, remarks, that in the petechial fever he has more frequently observed a diarrhœa critical, than either sweat or hæmorrhage. This crisis is generally for some time preceded by flatulence, gripes, and pains of the loins: it has been said to be prefiged by an intermitting pulse; (Nihell on the Pulse,) but the pulse has often been observed to intermit, when no diarrhœa succeeded. We believe, however, that diarrhœa, in the fevers of this country, is more frequently detrimental than critical; and where it is attended with much loss of strength, it is among the worst and most unmanageable symptoms of the disease. It is frequently, we believe, the consequence of a neglect to clear the bowels in the commencement of the disease.

The crisis, which is next in degree of importance and frequency, is hæmorrhagy or discharge of blood. It is curious to observe, that hæmorrhages, even to a considerable extent, are sometimes followed by immediate relief to the symptoms; even in typhous fevers, *i. e.* in those fevers which are characterized by great debility. The most frequent critical hæmorr-

hæmorrhages are those from the nose, and the quantity is generally small. These have been said, by the same whimsical author above quoted, to be presaged by a rebounding pulse, whose stroke seems double: (Nihell.) There is generally some heat, pain, or tension in the part whence the blood is about to flow. It may here be observed, that the relief which a trifling hæmorrhage from the nose sometimes affords to the patient, cannot be explained upon the notion of any morbid matter being evacuated with it. If there be a morbid humour in the circulating mass, it is quite absurd to suppose that a very trifling and partial abstraction of the blood can free the system of much of that humour, or that it can leave the remaining blood in the circulation less impregnated than before.

Other discharges have been mentioned as occasionally critical, such as vomiting, flow of saliva, cutaneous eruptions, abscesses, &c.; but these are comparatively rare.

Although the diseases which we are accustomed to see in this climate, and in persons using a mode of life altogether different from that of the ancients, are by no means the same with those recorded by the physicians of Greece and Rome, and differ especially in the rarity of well-marked crises; yet the observation of those imperfect crises, those perceptible changes for the better or worse, which are frequently accompanied by some evacuation, occurring in modern diseases, is important. In the first place it will aid us in forming a correct prognosis of the termination of diseases; and secondly, which is of greater consequence, it will assist us in the choice of proper measures in their cure. It will enable us, for instance, to judge of the propriety of suppressing, or of allowing to proceed those evacuations which obviously tend to augment or to alleviate the original disorder, and will point out to us when we may aid or imitate the processes of nature in the constitution. The speedy relief, or the continuance and even increase of the symptoms of the disease, is the best criterion of the beneficial or injurious nature of such evacuations. The ancients, however, had two sorts of tests by which their prognosis and practice were guided. The first and most important point was, according to Galen, the observation of the *concoctions* of the urine, excrement, and the sputa. I have been present, he says, a thousand times during the occurrence of crises, and I never saw one person die, whose crisis was preceded by concocted discharges. (De Crisibus, lib. iii.) The second point in importance, according to the same writer, was the observation of the *day* on which the crisis took place. For it had been remarked from the time of Hippocrates, that these sudden crises occurred more frequently on certain days, reckoned from the commencement of the disease, than on others; and those were hence termed *critical days*. See *CRITICAL DAYS*. The crisis was considered as most likely to prove curative if it had been *indicated*, i. e. if an amendment had taken place on the previous critical day; and especially if it occurred on a critical day of great power. The observation of the species and type of the disease, also aided the ancient prognosis; as, whether it was quotidian, tertian, ardent fever, pleurisy, &c.; or whether moderate, mild, malignant, and so forth. And farther, they did not omit to note, whether the sort of discharge was correspondent with the nature of the disorder. Some of their observations on this head are fanciful, and purely hypothetical. Thus Galen asserts, that when the convex part of the liver is diseased, a crisis takes place in three ways; namely, by hæmorrhage from the right nostril, by free sweats, and copious discharge of urine. When the concave parts of the liver are affected, the crisis is completed by means of bilious stools, and sweat, and sometimes by vomiting. It is un-

cessary to detail the various observations of this sort which have been transmitted to us by the ancient physicians. The reader who is curious on the subject, will find an ample collection of them in Galen's three books, *De Crisibus*, particularly in the third; and also in his book, *De Diebus Decretoriis*. See also Van Swieten's Commentaries, Aph. 587.

CRISNA, or KRISHNA, in *Geography*, a river of India; called also KISTNAH; which see.

CRISNEZ, CAPE, a cape on the coast of France, in the English channel, between Boulogne and Calais. N. lat. 50° 50'. E. long. 1° 35'.

CRISP, TOBIAS, in *Biography*, a divine of the church of England, was born at London in the year 1600. He was educated at Eton, and from thence he removed to Cambridge, and afterwards to Balliol college, Oxford. In the year 1627 he was appointed rector of Brinkworth in Wiltshire, and shortly after he took his degree of doctor in divinity. In early life he was the favourer of the doctrines of Arminianism, but as he advanced in life he stood forth as the champion of Antinomianism. During his life-time he published nothing in justification of his tenets; but after death sermons in three volumes 8vo. were printed, which were afterwards published in one volume 4to. He died in 1642-3; and though the tenets which he embraced seem to be a plea for licentiousness, yet Dr. Crisp was himself remarkable for the chasteness of his piety, the purity and sanctity of his manners, and the humility and modesty of his deportment. His income being ample, he devoted a considerable part of it to works of hospitality and kindness.

CRISPELT, in *Geography*, a mountain of Switzerland, in the canton of Uri, 10 miles S.E. of Altroff.

CRISPELLO, a town of Naples, in the province of Abruzzo Citra; 25 miles E. of Civita Borella.

CRISPI, SCIPIONE, in *Biography*, a painter of the 16th century, a native of Tortona, in the state of Piedmont. In the church of that place is a picture of the Madonna, with St. Francis and St. Dominic, bearing his name, and the date 1592, and in Voghera, the meeting of Mary and Elizabeth, in the church of St. Lorenzo, both evincing him an artist of no small abilities. Lanzi.

CRISPIANA, in *Ancient Geography*, a place of Pannonia, in the route from Sirmium to Carnuntum, between Ulmi and Mursa, according to the Itinerary of Antonine.

CRISPUM FOLIUM, in *Botany*, a curled leaf, has its border considerably more dilated than the disk, in consequence of which the former part becomes elegantly curled and twisted. Linnæus thought this a morbid luxuriance, and with great probability. It is the characteristic mark of *Malva crispa*, the curled mallow, a plant cultivated chiefly for ornamenting the table in deserts, and which seems most likely to be a variety of *Malva verticillata*; yet it retains its peculiar character when propagated by seed, at least in the rich soil of a garden. The above term is also applicable to the margin of the cup or nectary in several species of *Narcissus*, even in their natural state. With respect to leaves, the reverse of this character is *folium concavum*, a concave leaf, whose margin is more tight than the disk, like *Cyamus Nelumbo*. Sm. Exot. Bot. t. 32. S.

CRISPUS, ANTHONY, in *Biography*, born June 11th. 1600, at Trepani, a town in Sicily, received the early part of his medical education under his father, whom he succeeded in his practice, in which he became so famed, that persons resorted to him for his advice, not only from the most distant parts of the island, but from many parts of Italy also. Towards the latter end of his life, which was extended to the year 1688, he united the office of priest to that of physician, and a few years before his death, he retired altogether

from business. The following are the titles to a few of his numerous publications: "In lethargum fabri supervenientem acutæ, Commentarii duo." Panorini, 1668, 4to. "De sputo sanguinis a partibus corporis infirmis, supervenientis cum Tussi, &c." 1682, 4to. The practice here recommended has been very little altered since his time; also a treatise on the cure of infectious fever by venesection and cathartics, the mode now recommended in the yellow fever, and on the most celebrated mineral waters of the island, with an examination of their constituent parts. Haller Bib. Med. Eloy. Diæt. Hist.

CRISSA, in *Ancient Geography*, a town of the Locrian Ozoli, near the gulf Crisæus, formed by a part of the gulf of Corinth, and now called "Golfo di Salona."

CRISSE, or KREESE, in *Military Language*, a kind of dagger used by the Malays, particularly in the island of Ceylon; the blade of which is of the best tempered steel, and often in a serpentine form, so as to inflict a most dreadful wound; the handle is of ivory or wood, carved into the figure of a man's body and arms, with a head representing something between that of a man and a bird: this they call their "swaming," or god; and to this figure they make their "salam," or obeisance, before they draw the kreefe to execute any bloody purpose on which they have determined. After they have ratified their vow by this ceremony, they draw their kreefe, and never again sheath it till they have drenched it in blood. So resolute is their ferocious disposition, that if their adversary is placed beyond the reach of their vengeance, sooner than not indulge it they will plunge the dagger into the body of a pig, dog, chicken, or any other living animal which happens to come in their way. The scabbard is made of wood, frequently ornamented with gold or silver wire; and the whole appearance of the weapon, as well as the mode of wearing it, on the right side, greatly resembles that found in the ancient dress of the Celtic nations. This terrible instrument is rendered still more so by its being always poisoned, commonly by the juices of some poisonous herbs, and among those who can procure it, with poison from the Upa tree. These daggers, in the use of which the Malays are peculiarly dextrous, are regarded by them with veneration, and they descend as sacred relics from father to son, and from generation to generation. No money is accounted sufficient to purchase them, and no violence can compel their owners to give them up. When a Malay is pressed in battle, he will sooner be slain, or kill himself, than surrender his kreefe to the enemy.

CRISTA, a *Crest*, in *Botany*, applies to several accessory parts, or appendages, chiefly belonging to the *antheræ* of plants, thence said to be *crislata*, as in the genus *Erica* and that of *Pinus*, in both which instances the crest of the *antheræ* is of great use in furnishing specific characters. The same term is used for an elegant double tuft or fringe, attached to the keel of the flower in many species of *Polygala*, milkwort, whence such species are denominated *crislata*, and they form a section in the genus by themselves. The pod of *Hedysarum Caput galli*, and *H. Crista-galli*, has a curious crest, running along its upper edge, which has given occasion to the names of these two species. In the former of them its segments are awl-shaped and simple; in the latter flat, dilated, and toothed; which marks afford a good specific difference. See HEDYSARUM. S.

CRISTA-Galli, in *Anatomy*, a process standing out from the middle of the upper surface of the cribriform lamella of the ethmoid bone. See SKELTON.

CRISTA-Galli, in *Botany*, Ger. Lob. See RHINANTHUS *Crista Galli*.

CRISTA Galli, in *Conchyliology*, the name of a peculiar

species of muscle, called also by some *auris porci*, or the hog's ear shell. See MYTILUS.

CRISTÆ is also a term used in *Surgery*, for certain preternatural excrescences arising about the fundament, resembling cock's combs.

These, M. Dionis says, are taken off either by ligature, cauterization, or amputation. When they have other figures they have other names, as *ficus*, &c. See CONDYLOMA.

CRISTA is also used for a crooked, twisted, spiral eminence, in the middle of the spine of the *omoplata*.

CRISTA pavonis, in *Botany*, a name by which some authors have called the poinciana.

CRISTA pavonis is also a name given to the tree, the wood of which is usually denominated logwood.

CRISTARIA, *coccinea*; Sonn. See COMPRETUM *decandrum*.

CRISTIANA, or CRISTINA, in *Geography*, a small island of the Grecian Archipelago, in the Cretan Sea; the ancient Letoa. N. lat. 36° 20' E. lon. 25° 16'.

CRISTOFORI, or CRISTOLANI, FABIO, in *Biography*, an artist of the 17th century, who carried the art of painting in Mosaic to the greatest perfection. The St. Petronilla, from the large picture by Guercino, St. Girolamo, from Domenichino, and the baptism of Christ from Carlo Maratta, in the church of St. Peter at Rome, are sufficient proofs of his extraordinary abilities. He had a son, named Pietro Paolo, who assisted him in the work. The latter died after 1736. Lanzi.

CRISTOFORO, a painter of the 14th century, who is said by some to have been a native of Ferrara, by others of Modera. These cities dispute the honour of having given birth to this early artist. The abbé Lanzi does not pretend to decide the question, but he informs us that he painted many works both in fresco and distemper at Bologna, in a style evidently not derived from the school of Florence. Some of Cristoforo's pictures bear the date 1382. Lanzi.

CRISTONÆI, in *Ancient Geography*, a people placed in the vicinity of Scythia by Stobæus, who says that the women burnt themselves on the bodies of their deceased husbands.

CRITALÆ, or CRITALI, a town of Asia, in Cappadocia. Herodotus.

CRITERIUM, or CRIFERION, formed of κρινω, *I determine*, a rule or standard whereby to compare propositions and opinions, in order to discover their truth or falsehood.

The doctrine of criteria, and the characters and rules thereof, make the first part of the Epicurean philosophy. Evidence is the grand criterion of truth.

CRITH, or CORATH, in *Ancient Geography*, a torrent of Palestine, which commenced in Acrabaterra, near Silo, ran by the north-west, passed S.E. of Phasæis, and emptied itself into Jordan.

CRITHE, κριθη, in *Surgery*, a small tubercle, hard, red, and immoveable, seated upon the eye-lid, above the cilia, or range of hairs. It is always included in a kind of cysta, and by inflammation degenerates into a thickish matter, from whence frequently proceed intense pains, and various disorders of the sight. It is sometimes seated immediately under the skin of the eye-lid: sometimes it is within, under the muscle. When this tubercle is moveable, it is generally called *chalazion*, or in English *stye*, or *stibbe*.

CRITHMUM, in *Botany*, (κριθμων, Diosc.) Linn. Gen. 340. Schreb. 473. Willd. 537. Tourn. Cl. 7. § 4. gen. 7. Juss. 223. Vent. 3. 27. Cl. and order, *pentandria digynia*. Nat. Ord. *Umbelata*, Linn. *Umbellifera*, Juss.

Gen. Ch. *Cal. involucre universal*, many-leaved β; leaflets lanceolate,

lanceolate, obtuse, reflexed; *partial* lanceolate-linear. Perianth proper, scarcely discernible. *Cor.* Universal and *partial* umbels uniform; florets all fertile; petals five, egg-shaped, inflexed, equal. *Stam.* Filaments five, longer than the corolla; anthers roundish. *Pist.* Germ inferior; styles two, reflexed; stigmas obtuse. *Peric.* none; fruit oval, compressed, striated, dividing into two elliptical flattish seeds.

Ess. Ch. Fruit oval, compressed, striated. Flowers equal; calyx entire.

Sp. 1. *C. maritimum.* Linn. Sp. Pl. 1. Mart. 1. Lam. Willd. 1. Jac. Hort. tab. 187. Eng. Bot. 819. (*Crithmum* five *feniculum maritimum* minus; Bauh. pin. 288. Tourn. 377.) Rock samfire, from the French St. Pierre, often coarsely pronounced, and spelt samphire. "Leaflets lanceolate, fleshy." *Root* perennial, branched. *Stems* about a foot high, hard and somewhat woody at the base, nearly erect, cylindrical, leafy, moderately branched. *Leaves* twice or thrice ternate; leaflets acute, quite entire, smooth, rather glaucous, recurved-ascending. *Flowers* in dense umbels, greenish white; petals incurved, broad at the base, not furnished with claws. *Fruit* somewhat spongy, smooth. A native of rocks on the sea-coast of Italy, Spain, France, and the south of England. On the continent the leaves pickled in vinegar are in common use at the table; but in England the much more common *falicornia* has generally usurped its name and place, though a very inferior substitute, and entirely destitute of its aromatic flavour. That it grows on Dover cliff is known to every reader of Shakspeare. We have met with it in Cardiganshire, but in no part of the north of England. 2. *C. latifolium.* Mart. 3. Willd. 2. Linn. jun. Supp. 180. Hort. Kew. 1. 342. "Leaflets wedge shaped, cleft." A very smooth plant, a foot and half high." *Root* biennial. *Stem* erect, cylindrical, furrowed. *Leaves* petioled, pinnated; leaflets in two or three pairs, sessile, decurrent at the outer edge, gradually dilated; lobed, toothed; petioles dilated at the base, embracing the stem. Universal and *partial* involucre of six or seven leaves. *Flowers* yellow. *Seeds* smooth, furrowed, even and elevated at the edges. A native of Teneriffe.

CRITHMUM maritimum spinosum; Bauh. Pin. See *ECHINOPHORA spinosa*.

CRITHMUM pyrenaicum; Linn. See *ATHAMANTIS libanotis*.

CRITHMUM, in *Gardening*, comprises a plant of the herbaceous succulent, perennial, esculent kind; the sea or rock samfire (*C. maritimum*.)

Method of Culture.—This is a plant which, from its being a native of the sea-coasts, is raised in the garden with some difficulty. In order to its successful culture, it should have a rather moist, sandy, or gravelly situation, and be duly supplied with moisture.

It may be propagated either by sowing the seeds in the places where the plants are to remain, in the early spring months, to the depth of about half an inch, or by parting the roots, and planting them out where they are to remain, in the beginning of autumn.

When the plants have been introduced in either of these methods, they will continue for a number of years.

The leaves constitute an admirable pickle, and are sometimes used in fallads, as well as for other culinary purposes.

CRITHOMANCY, a kind of divination, performed by considering the dough, or matter of the cakes offered in sacrifice; and the meal strewed over the victims to be killed. Hence, as they ordinarily used barley-meal in these ceremonies, this kind of divination was called *cribhomancy*, from κριθα, *barley*, and μαντικη, *divination*.

CRITICAL DAYS, in *Medicine*, are those days on which the crises of diseases occur most frequently.

The observation of those sudden changes in febrile disorders, which have been denominated crises, originated with Hippocrates; and the same acute observer remarked, that these crises occurred, in a great number of patients, on particular days of the fever: whence he termed these days *critical* or *judicial* days. It is not, indeed, stated that crises never occur, except on these particular days; on the contrary, there is no day on which a crisis has not been observed to take place: but the crises which occur on the non-critical days are much more rare, and less complete, seldom putting a final termination to the fever.

As the doctrine of critical days was denied and derided by some of the ancients, who had an opportunity of observing diseases under the same common circumstances, we cannot be surprised that many modern physicians should have disputed its truth; especially those who reside in northern climates. For in those climates diseases are less acute, and less disposed to become periodical; crises, therefore, are less frequent, and slighter, and critical days consequently less obvious: not to mention the difference occasioned by the more active modern practice. On the shores of the Mediterranean sea, Dr. Cleghorn observes, that "both these classes of fevers (*viz.* those of summer and winter), and indeed almost all others which happen in that climate, whether primary or symptomatical diseases, may be termed periodical; having remissions and intervals more or less considerable." (On the Diseases of Minorca, chap. vi. p. 259.) This is very far from being the case in the diseases of more northern latitudes. There is still, however, a presumptive evidence, in favour of the disposition to periodical exacerbation and remission in our diseases, sufficiently strong to have satisfied Dr. Cullen, and other distinguished moderns, of the truth of the doctrine of critical days.

This evidence, *a priori*, consists in the obvious disposition of the constitution, in a state of health, to periodical motions. Thus, the appetite for food, which would seem to depend altogether upon the evacuation of the stomach, and the secretion of the gastric juice, returns rather at the habitual period of eating; and, if not then gratified, frequently ceases to be urgent, although the emptiness of the stomach and the production of the digestive liquor continue. The same is in a great degree true with respect to the return of drowsiness, at the usual period of sleep, whether the body is exhausted or not; and the discharges from the bowels are much regulated by this habitual recurrence of time. The disposition to periodical actions is also obvious in many disorders. We need not particularize the quotidian, tertian, and quartan periods of intermitting fevers; the regular return of the paroxysms of intermitting headache, &c. It is frequently evident also in the returns of epileptic and maniacal paroxysms, of the attacks of hæmorrhoids or piles, of gout, of abortion, and so forth. In the eruptive fevers, there are certain regular periods of the appearance and cessation of the fever and eruption, inclining to the tertian interval. Thus Dr. Cullen describes the small-pox: "*Tertio die incipit, et quinto finitur eruptio,*" &c. There is obviously a diurnal revolution in the body, produced by the irritations of the day, and the suspension of them in the night: thus, the pulse is quicker in the evening than in the morning, in health; and hence, perhaps, the general evening paroxysm of hætic and other fevers. But having, in addition to these facts, the testimony of Dr. Cleghorn, Dr. Jackson, and many other respectable physicians, of the general tendency of all fevers to intermissions, in warm climates,

CRITICAL DAYS.

we can have little doubt that the observations of Hippocrates are founded in truth.

The doctrine of critical days, however, as delivered by Hippocrates, and his great commentator, Galen, is involved in some confusion, and not a little inconsistency. This has been attributed to the circumstance, that the works, to which the name of Hippocrates is attached, were not all written by one person; and also to the errors of transcribers. From whatever cause, the doctrine is obscured by such inconsistency, and has been made open to dispute from early times.

The substance of the doctrine is found in the books on Prognostics, and in the Aphorisms of Hippocrates; and the facts, on which it is founded, are related in the treatise on Epidemics. Galen believes that the latter was first written, and the former deduced, by induction, from the facts which it contains. In one of his aphorisms Hippocrates states, that "sweats in febrile patients are salutary, if they begin on the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, twenty-first, twenty-seventh, thirty-first, or thirty-fourth days; for these sweats terminate the disease. But the sweats which happen not on these days, denote that the disease will be long, difficult of cure, and liable to relapse." (Aph. 36. sect. 4.) It will be observed, that the twenty-first day is here enumerated among the *critical days*. This is considered by Van Swieten and Cullen as an error of transcription, or an interpolation. But the twenty-first day is mentioned in other places in the works of Hippocrates; and Galen admits it to be critical, although less frequently than the twentieth day. Archigenes, he observes, considered the twenty-first day as more frequently critical than the twentieth; and Diocles deemed it next after the twentieth in critical power. (Galen de Dieb. Decretoriis, lib. i. cap. 10. and lib. iii. cap. 9.) Dr. Cullen's reason for denying the critical quality of the twenty-first day is somewhat hypothetical. From the universal tendency to tertian and quartan periods in intermittent fevers, he presumes such a tendency to exist in the animal economy in all fevers: and hence he believes the critical days to occur at tertian periods to the eleventh day, and afterwards at quartan periods to the twentieth, or perhaps longer. The critical days, according to his notion, are therefore the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, and twentieth. (First lines, par. exi. *et seq.*) After this he marks no critical day; because, though fevers are sometimes protracted beyond this period, it is more rarely, so that there are not a sufficient number of observations to ascertain the course of them; and because it is probable that, in fevers long protracted, the movements become less exact and regular, and therefore less easily observed. He believes also that this is the series of critical days, from comparing the facts, which are related in the writings of Hippocrates. From these facts, as collected by M. de Haen, it appears, that of 163 instances of the termination of fevers, which happened on one or other of the first twenty days of the disease, there are 107, or more than two-thirds of the whole number, which happened on one or other of this series of days; that none happened on the second or thirteenth day; and upon the eighth, tenth, twelfth, fifteenth, sixteenth, eighteenth, and nineteenth, there were but 13 instances of termination, or one-ninth of the whole. And, he adds, the many terminations which happened on the seventh, fourteenth, and twentieth days, afford a proof both of critical days in general, and that these are the chief of them.

But the majority of the observations of Hippocrates and Galen applies to a different series of days from those above stated, in which some days are included as frequently cri-

tical, which are altogether omitted in the preceding list. Whether altogether from the induction of experience, or whether under the influence of some Pythagorean hypothesis, as to the power of number, Hippocrates considered the septenary period as the most important, and the quaternary, or division of the former, the second in critical power. Thus the fourth, seventh, eleventh, fourteenth, seventeenth, and twentieth, are deemed the most frequently critical; but not in the order here stated. The seventh, the fourteenth, and the twentieth, were the most powerfully critical; the fourth, eleventh, and seventeenth, less critical, but connected with the former as indices; so that any change taking place on the fourth day of each week, indicated a similar and more complete change on the seventh. The third, fifth, sixth, and ninth, which are occasionally critical, but of feeble power, *i. e.* seldom finally and salutarily critical, were called by Galen *incidental or coincidental* critical days. Thus Galen observes, (lib. ii. cap. 8. De Diebus Decretoriis,) "the most powerful of all is the seventh day: the fourth presages it, having these two qualities, being a minor critical day, and an index to the seventh. Then come the fourteenth and eleventh, bearing the same proportion, and being of the same reciprocal nature to each other as the seventh and fourth: then the seventeenth as allied to the twentieth, rarely the eighteenth, as connected with the twenty-first. The ninth, fifth, and third days are coincidental with these; the ninth being most frequently critical; the fifth second in critical power; and after it, the third. The sixth is elsewhere mentioned as a bad critical day. The thirteenth is the weakest of all critical days; but the most powerful of all non-critical days, inasmuch as it stands in a sort of medium between the two, &c."

In book i. chap. 2. Galen remarks, "on the twelfth and sixteenth I never saw a crisis occur; but I am unable to number the crises which I have witnessed on the seventh day. On the sixth day crises do take place, but with symptoms of difficult concoction, and no small danger, and they are not to be relied on, being imperfect, obscure, and prejudicial." Of the critical terminations happening on the sixth day, among the histories related by Hippocrates, there is not one which proves finally salutary; the greater number are fatal; and all the rest are imperfect, and followed by a relapse. Hence Galen calls the sixth a *bad* critical day; and he compares the seventh and sixth days to a king and a tyrant: the former, like a good prince, judging in mercy and clemency, and mitigating the punishment or favouring the acquittal of his subjects; the latter, gratified with their sufferings, and prolonging the infliction of punishment to the uttermost.

With respect to the fourth, which is omitted to be mentioned in the list of critical days, in the aphorism, much importance is given to it in other places. Hippocrates observes, in his prognostics: "But the physician must attend to all the appearances from the very first day of the disease, and consider the sum of his observations on every *fourth* day; by which means he will not be unacquainted with the course that the disease is about to take." Again, he says, in Aphorism 71, sect. 4, "when a crisis happens on the seventh day, there is a small red cloud in the urine on the fourth day, and other things are proportionate to this appearance." The fourth day, therefore, is, in general, only an *indicating* day to the seventh, and never proves finally critical, except in slight fevers, or in some which are extremely acute and rapid. (De Prognost.) It is obvious, then, that each critical day, in the quaternary and septenary periods, is considered as related to the succeeding critical day, in the quality of an *indicator*; the fourth as an index

to the seventh, the seventh to the eleventh, and so on. Thus, if on a critical day, the patient finds himself better, although on the following day he relapses into his former state, the physician may expect a more remarkable remission on the subsequent critical day. On the contrary, if the patient find himself worse on a critical day, a still more unfavourable change is to be looked for on that which follows, although during the intermediate days the symptoms become milder.

This doctrine had an extensive influence over the practice of the ancients, who watched these days with particular attention, and almost suspended medical assistance, lest they interrupt or derange the processes of nature in the constitution. Galen is minute in the detail of circumstances, by which such a prejudicial interruption or derangement may be occasioned. (*De Deib. Decret. lib. i. cap. 2.*) The crises, which occur on the *coincidental* critical days, *viz.* the third, fifth, sixth, and ninth, and which are imperfect, and not to be depended on, were attributed to some pernicious interference of this sort, or to a fresh paroxysm of the disease, and were considered as anticipations of the proper critical days, on which the regular unexcited operations of nature would have terminated the disease. For the process of concoction requires a certain time to be completed, says Van Swieten, pursuing the humoral hypothesis. But as it is improper to open an inflamed part before the matter is completely formed; so likewise evacuations made in fevers, before nature has subdued and separated the morbid from the healthy humours, can hardly be of any service, because they remove only part of the morbid matter, whence a return may be expected from what remains, &c. (*Commentaries, Aph. 741.*) The coincidental critical days are most numerous in the first septenary, or week, because, according to the ancients, the violence of fevers which run their course in so short a time as one week, often disturbs the crisis which ought to happen only on the 4th or 7th day. In the second septenary, the ninth is esteemed almost the only coincidental critical day; and after the fourteenth day, the coincidental days are of little consequence, the crises generally occurring on the true critical days. We shall say nothing respecting the critical days after the twentieth and twenty-first, although much is said by the ancients, even beyond the hundredth day; as it is confessed that they are few, and not easily assigned to a particular day.

Although this doctrine of critical days was generally adopted among the ancients, it was rejected by some. Herophilus, as Galen informs us, denied its truth; and Aesculapiades deemed it idle and nugatory. Celsus coincides with them, and derides it, on account of its inconsistency in itself; intimating also that it is a doctrine taken up by those physicians, who, for the sake of gain, wish to visit a great number of patients; since it is much easier to count days, even without seeing the patient, than to sit by him, and watch the symptoms as they change. (*De Medicina, lib. iii. cap. 4.*) The inconsistency, observed by Celsus, is this. Hippocrates considers the *fourth* day in each septenary as critical; hence the fourth, and the eleventh (taking the 8th as the first of the second septenary) are critical. But he assimilates the seventeenth with these as a fourth; whereas the 17th is only the *third* of the 3d septenary; for the eleventh is the 5th from the seventh; but the seventeenth is only the 4th from the fourteenth. This also makes the twentieth the last of the 3d septenary, instead of the twenty-first.

Various conjectures were entertained respecting the causes of these periodical movements in fevers. Some attributed them to the harmony of numbers, according to the Pytha-

gorean philosophy, and Celsus and others have conceived that Hippocrates was swayed by this absurd doctrine. But Van Swieten states the irregularity, just related, as a proof that Hippocrates deduced his numbers from a faithful observation of diseases. Galen imagined that the crises of fevers were caused by the changes of the moon; and this notion has been also entertained by Dr. Jackson and some other modern physicians.

Such is the doctrine of critical days delivered by the ancients, as observed in Greece and Asia Minor. The diseases of those climates being very different from those of our own, we cannot expect the doctrine to apply here. Although changes for the better or worse are often well marked, yet they are rarely preceded by those perturbations of the constitution which belong to a complete crisis. The following list of well marked terminations, in a hundred and twenty cases of the contagious malignant fever of this country, is given by Dr. Willan in his "Reports on the Diseases of London," p. 233.

Days of Fever.	Number of Cases.
4th.	Six.
5th or 6th.	Three.
7th.	Ten; one case fatal.
8th and 9th.	Five; two cases fatal.
10th and 11th.	Ten; two cases fatal on the 10th night; three on the 11th day.
12th.	Twelve; one case fatal.
13th.	Five; one case fatal.
14th.	Thirty; one case fatal.
15th.	Two.
16th.	None.
17th.	Fourteen.
18th.	One, fatal.
19th.	One, fatal.
20th.	None.
21st.	Twelve.
22d.	Three.
28th.	Two.
29th.	Three.
30th to 40th.	Two.

Here we find the two septenaries, and the 17th the most complete critical days, and the proper third septenary, or 21st, also critical; but no crises on the 20th, or third septenary of Hippocrates. On one of the days, in which Galen never saw a crisis, *viz.* the 16th, none occurred; but the other, the 12th, was here the third in critical quality. If the regular crises are as easily deranged as the ancients affirm, this list will rather tend to confirm the doctrine than otherwise; and the 12th and 21st may perhaps be the 11th and 20th postponed. But it must be remembered that, in the fevers of this country, the time of commencement is frequently obscure, and not to be ascertained; and that true crises are rare. A mere list of terminations of fever, therefore, such as that published in the second Report of the House of Recovery at Dublin, are of no value, as illustrations or refutations of the ancient doctrine. See CRISIS and CONCOCTION.

CRITICISM, the art of judging concerning discourse and writings. See JUDGMENT.

Some define criticism, more amply, the art of judging of a history, or a work of genius, with the various incidents there met with, their style and authors.

On which footing, M. le Clerc seems to have given a defective idea of criticism, when he defines it simply the art of entering into the meaning of ancient authors, and of making

ing a just discernment of their genuine works. True criticism, says Dr. Blair, (*Lect. on Rhet.* vol. i. p. 36, &c.) is the application of taste and of good sense to the several fine arts. The object which it proposes is to distinguish what is beautiful and what is faulty in every performance; from particular instances to ascend to general principles; and so to form rules or conclusions concerning the several kinds of beauty in works of genius.

The rules of criticism are not formed by any induction *à priori*; that is, by a train of abstract reasoning, independent of facts and observations. Criticism is an art founded wholly on experience; on the observation of such beauties as have been found to please mankind most generally, *e. g.* Aristotle's rules concerning the unity of action in dramatic and epic compositions, were not rules first discovered by logical reasoning, and then applied to poetry; but they were drawn from the practice of Homer and Sophocles; they were founded upon observing the superior pleasure which we receive from the relation of an action which is one and entire, beyond what we receive from the relation of scattered and unconnected facts. Such observations, taking their rise at first from feeling and experience, were found on examination to be so consonant to reason, and to the principles of human nature, as to pass into established rules, and to be conveniently applied for judging of the excellency of any performance. This, as Dr. Blair conceives, is the most natural account of the origin of criticism. To the same purpose Mr. Harris observes, (*Philological Inquiries*, ch. i.) that they were authors who made the first good critics, and not critics who made the first good authors; however writers of later date may have profited by critical precepts. Accordingly, criticism in its beginning was "a deep and philosophical search into the primary laws and elements of good writing, as far as they could be collected from the most approved performances." No observations or rules of criticism can supply the defect of genius, or inspire it where it is wanting; but they may often direct it into its proper channel, correct its extravagancies, and point out to it the most just and proper imitation of nature. Critical rules are designed chiefly to shew the faults that ought to be avoided; to nature we owe the production of eminent beauties. In tracing the history of criticism, we must begin with Aristotle, who may be justly regarded, notwithstanding some general principles suggested by Plato, as the inventor or father of the art, both from the age in which he lived, and from his truly transcendent genius. The criticism which he taught, has so intimate a correspondence and alliance with philosophy, that it may be called "philosophical criticism." To Aristotle succeeded Theophrastus, who followed his master's example in the study of criticism, as may be seen in the catalogue of his writings preserved by Diogenes Laertius, (*lib. v. § 46, 47, &c.*) But all the critical works of Theophrastus are now lost, as well as those of many others. The principal authors of the kind now remaining in Greek, are Demetrius of Phalera, who was the earliest, and appears to follow the precepts and even the text of Aristotle more closely than any of the rest; Dionysius of Halicarnassus, who has written with judgment upon the force of numerous composition, besides other tracts on rhetoric, both critical and historical; Longinus, who seems to have principally had in view the passions and imagination, in the treating of which he has acquired just applause; and also Hermogenes, Aphthonius, and a few others. Among the Romans, the first critic of note was Cicero, who, though far inferior to Aristotle in depth of philosophy, may be said, like him, to have exceeded all his countrymen. Next to Cicero came Horace, whose art of poetry is a standard

of its kind, and too well known to need any encomium. After Horace arose Quintilian, Cicero's admirer and follower, who appears, by his works, not only learned and ingenious, but an honest and worthy man. The latter Latin rhetoricians need not be mentioned, as they have not contributed much towards the illustration of the subject of philosophical criticism. Among the cultivators of "historical criticism," we find a tribe of scholiasts, commentators, and explainers. These naturally attached themselves to particular authors; Arriarchus, Didymus, Eustathius, and many others bestowed their labours upon Homer; Proclus and Tzetzes upon Hesiod; the same Proclus and Olympiodorus upon Plato; Simplicius, Ammonius, and Philoponus upon Aristotle; Ulpian upon Demosthenes; Macrobius and Arrianus upon Cicero; Calliergus upon Theocritus; Donatus upon Terence; Servius upon Virgil; Acro and Porphyrio upon Horace; and so with respect to others, as well philosphers, as poets and orators. To these scholiasts may be added the several compilers of Lexicons; such as Hesychius, Philoxenus, Suidas, &c. and also the writers upon grammar, such as Apollonius, Priscian, Sossipater, Charisius, &c. All these have completed, by their assiduity and labour, another species of criticism, which, by way of distinction from the former, may be denominated "historical criticism." When the Roman empire sunk through the west of Europe, an age succeeded of legends and crusades. At length, after a long and barbarous period, when the shades of monkery began to retire, and the light of humanity once again to dawn, about the time of Charlemagne and his sons, the art also of criticism insensibly revived. The authors of the philosophical part were not, indeed, many in number. Of this rank, however, among the Italians were Vida, and the elder Scaliger; among the French were Rapin, Bonhours, Boileau, and Bossu, the most methodical and accurate of them all. In our own country, the nobility may be said to have distinguished themselves, among whom we may mention lord Roscommon, in his "Essay upon translated Verse," the duke of Buckingham in his "Essay on Poetry," and lord Shaftesbury in his treatise entitled "Advice to an Author;" and to these we may add Pope in his "Essay upon Criticism." Although the number of philosophical critics among the moderns may be comparatively small, the writers of historical or explanatory criticism have been in a manner innumerable. Such were in Italy, Bernoldus, Ficinus, Victorius, and Robertellus; in the Higher and Lower Germany, Erasmus, Sylburgius, Le Clerc, and Fabricius; in France, Lambin, Du Vall, Harduin, Capperonierus; in England, Stanly, editor of Æschylus, Gataker, Davis, Clarke, Bentley, &c. &c. Among the compilers of Lexicons or Dictionaries we may mention Charles and Henry Stephens, Favorinus, Constantine, Budæus, Cooper, Faber, Vossius, &c. &c. To these we might add the authors on grammar, in which subject the learned Greeks, when they quitted the East, led the way: Moschopulus, Cryfoloras, Lascaris, Theodore, Gaza; then in Italy, Laurentius Valla; in England, Grocin, and Linacer; in Spain, Sanctius, professor of rhetoric and of the Greek tongue in the university of Salamanca, towards the end of the 16th century; in the Low Countries, Vossius; in France, Cæsar Scaliger, by his residence, though a native of Italy, and the Messrs. de Port Royal. Among modern critics of the explanatory kind, are lexicographers, grammarians, and translators; among whom Mr. Harris (*ubi supra*) has mentioned Mr. T. Warton, Mr. Tyrwhit, Mr. Upton, Mr. Addison, Dr. Warton, and Mrs. Montague. The dictionaries, says the same writer, of Minshew, Skinner, Spelman, Sumner, Junius, and Johnson, are well known and justly esteemed.

teemed. Dr. Lowth, and his admirable tract on grammar, are noticed with distinguished commendation. Among translators, our author enumerates Meric Casaubon, Mrs. Carter, and Mr. Sydenham. To these, he says, may be added the respectable names of Melmoth and of Hampton, of Franklin and of Potter; others might have been added if the author had not recollected the trite, though elegant admiration,

“ ——— Fugit irreparabile tempus,
Singula dum capti circumvectamur amore.”

Virgil.

The critics of our own times have been innumerable; but it might appear invidious to select names of recent, and more especially of living authors, out of the numerous class that must present itself to every one's own recollection.

Upon the whole, it must appear that criticism does, indeed, suppose an uncommon stock of knowledge of the subject whereon it is employed; but that criticism itself is nothing else but good sense perfected by grammar and logic.

We may distinguish divers sorts, or branches, of this art: as,

CRITICISM, *philosophical*, or the art of judging of opinions and hypotheses in philosophy.

CRITICISM, *theological*, the art of judging of explications, of doctrines, of faith, &c.

CRITICISM, *political*, the art of judging of the means of governing, acquiring, and preserving states.

But the ordinary use of the word is restrained to

CRITICISM, *literary*, which, however, is of great extent, as it takes in the art of judging of facts; a branch of criticism, which regards not only history, but also the discernment of the real works of an author, the real author of a work, the genuine reading of a text, and the art of discovering supposititious monuments, charters, interpolated passages, &c.

The other parts of *literary criticism* comprehend the art of judging of works of genius, their excellencies and defects.

Mr. Harris (*ubi supra*) divides this kind of criticism into three species, the *philosophical*, treating of the principles, and primary causes of good writing in general; the *historical*, being conversant in particular facts, customs, phrases, &c.; and the *corrective*, subdivided into the *authoritative*, which depends on the collation of MSS. and the best editions, and *conjectural*, depending on the sagacity and erudition of editors. We have also

CRITICISM, *grammatical*, or the art of interpreting and discovering the words and meanings of an author.

CRITICISM of *Antiques*, consists in distinguishing genuine medals, and the different taste and spirit found among them, according to the different people, the different country, and the different times wherein they were struck; the distinguishing between what is cast, and what struck; what has been retouched, and repaired or added, from what is really antique; the genuine from the spurious, &c; and to decypher and explain them, &c.

CRITICISM, *Sacred*, in general, is that employed in ecclesiastical matters, the history of the church, the works of the fathers, councils, lives of the saints, &c. but more particularly what concerns the books of the Holy Scriptures, and the canon thereof.

To this head we may refer *Conjectural Criticism*, for which see the article CONJECTURE. In connection with this part of the subject, we may mention that species of criticism which the ingenious Mr. Harris (*ubi supra*) called the *corrective*. All ancient books, having been preserved by trans-

cription, or fraud, to be corrupted in three different ways, *viz.* by retrenchments, by additions, and by alterations. As a remedy to these evils, *corrective* criticism was introduced. The business of this, at first, was carefully to collate all the various copies of authority, and then, from the variety of readings thus collected, to establish by good reason the *true*, or the *most probable*. In this sense such criticism may be denominated not only *corrective*, but *authoritative*. In ancient times various readings have been noted, in the text of Homer, and in that of Aristotle; which latter has been examined by his commentators, Ammonius and Philoponus; and Aulus Gellius has noticed the same as to Roman authors: but since the revival of literature, correction has been a more extensive business, and has employed, for 2½ centuries, the pains of the most laborious, and the wits of the most acute critics. Many of the learned men already enumerated were not only famous as historical critics, but also as correctives. Such were the two Scaligers, the two Casaubons, Salmasius, the Heinsii, Grævius, the Gronovii, Burman, Kuster, Wasse, Bentley, Pearce, and Markland; to whom we may add Toupe, Taylor, and Upton. This latter kind of criticism has been too often abused, and extended by conjecture to an undue extreme (see CONJECTURE); and authors have been treated, like anatomical subjects, with a view to the display of the skill and abilities of the artist; so that the design of various editions seems to have been merely the exhibition of the wonderful sagacity and erudition of an editor. The joy of the task has been the honour of mending, while corruptions were sought with a more than common attention, as each of them afforded a testimony to the editor and his art. “Critics,” says Mr. Harris, (if I may be allowed the metaphor,) “are a sort of *masters of the ceremony* in the court of letters, through whose assistance we are introduced into some of the first and best company. Shall we even, therefore, by idle prejudices against pedantry, verbal accuracies, and we know not what, come to slight their art, and reject them from our favour? 'tis well we do not slight also those classics, with whom criticism converses, becoming content to read them in translations, or (what is still worse) in translations of translations, or (what is worse even than that) not to read them at all. And I will be bold to assert, if that should ever happen, we shall speedily return into those days of darkness, out of which we happily emerged upon the revival of ancient literature.”

CRITICISM, *Musical*. As music may be defined the art of pleasing by the succession and combination of agreeable sounds, every hearer has a right to give way to his feeling, and be pleased or dissatisfied without knowledge, experience, or the fiat of critics; but then he has certainly no right to insist on others being pleased or dissatisfied in the same degree. We can very readily forgive the man who admires a different music from that with which we are pleased, provided he does not extend his hatred or contempt of our favourite music to ourselves, and imagine that on the exclusive admiration of any one style of music, and a close adherence to it, all wisdom, taste, and virtue depend.

Criticism in this art would be better taught by specimens of good composition and performance than by reasoning and speculation. But there is a certain portion of enthusiasm connected with a love of the fine arts, which bids defiance to every curb of criticism; and the poetry, painting, or music, that leaves us on the ground, and does not transport us into the regions of imagination beyond the reach of cold criticism, may be correct, but is devoid of genius and passion. There is, however, a tranquil pleasure, short of rapture, to be acquired from music, in which intellect and

fevation are equally concerned; the analysis of this pleasure is, therefore, the subject of the present short essay; which, it is hoped, will explain and apologize for the critical remarks which have been made in the course of this history, on the works of great masters, and prevent their being confounded into pedantry and arrogance.

Indeed, musical criticism has been so little cultivated in our country, that its first elements are hardly known. In justice to the late Mr. Avison, it must be owned, that he was the first, and almost the only writer, who attempted it. But his judgment was warped by many prejudices. He exalted Rameau and Geminiani at the expense of Handel, and was a declared foe to modern German symphonies. There have been many treatises published on the art of musical composition and performance, but none to instruct ignorant lovers of music how to listen, or to judge for themselves. So various are musical styles, that it requires not only extensive knowledge, and long experience, but a liberal, enlarged, and candid mind, to discriminate and allow to each its due praise:

“ Nullius in verba magistri.”

A critic should have none of the contractions and narrow partialities of such as can see but a small angle of the art; of whom there are some to bewilder in tangles and complicated contrivances, that they can receive pleasure from nothing but canonical answers, imitations, inversions, and counter-subjects; while others are equally partial to light, simple, frivolous melody, regarding every species of artificial composition as mere pedantry and jargon. A chorus of Handel and a graceful opera song should not preclude each other: each has its peculiar merit; and no one musical production can comprise the beauties of every species of composition. It is not unusual for disputants, in all the arts, to reason without principles; but this, we believe, happens more frequently in musical debates than any other. By principles, we mean the having a clear and precise idea of the constituent parts of a good composition, and of the principal excellencies of perfect execution. And it seems, as if the merit of musical productions, both as to composition and performance, might be estimated according to De Piles' steel-yard, or test of merit among painters. If a complete musical composition of different movements were analysed, it would perhaps be found to consist of some of the following ingredients: melody, harmony, modulation, invention, grandeur, fire, pathos, taste, grace, and expression; while the executive part would require neatness, accent, energy, spirit, and feeling; and, in a vocal performer, or instrumental, where the tone depends on the player, power, clearness, sweetness; brilliancy of execution in quick movements, and touching expression in slow.

But as all these qualities are seldom united in one composer or player, the piece or performer that comprises the greatest number of these excellencies, and in the most perfect degree, is entitled to pre-eminence: though the production or performer that can boast of any of these constituent qualities cannot be pronounced totally devoid of merit. In this manner, a composition, by a kind of chemical process, may be decomposed as well as any other production of art or nature.

Prudent critics, without science, seldom venture to pronounce their opinion of a composition, decisively, till they have heard the name of the master, or discovered the sentiments of a professor; but here the poor author is often at the mercy of prejudice, or envy. For the opinion of professors of the greatest integrity is not equally infallible concerning every species of musical merit. To judge minutely

of *singing*, for instance, requires study and experience in that particular art. Indeed, we have long suspected some very great instrumental performers of not sufficiently feeling or respecting real good singing. Rapid passages neatly executed seem to please them infinitely more than the finest *mezza di voce*, or tender expression of slow notes, which the sweetest voice, the greatest art, and most exquisite sensibility, can produce. They frequently refer all excellence so much to their own performance and perfections, that the adventitious qualities of singers who imitate a hautbois, a flute, or violin, are rated higher than the colouring and refinements that are peculiar to vocal expression; which instrumental performers ought to feel, respect, and try to imitate, however impossible it may be to equal them: approximation would be something, when more cannot be obtained. Of *composition*, and the genius of particular instruments, whose opinion, but that of composers and performers, who are likewise possessed of probity and candour, can be trusted? There are, alas! but too many professors who approve of nothing which they themselves have not produced or performed. Old musicians complain of the extravagance of the young; and these again of the dryness and inelegance of the old.

And yet, among the various styles of composition and performance, the partial and capricious tastes of lovers of music, and the different sects into which they are divided, it seems as if the following *criteria* would admit of little dispute.

In *church music*, whether jubilation, humility, sorrow, or contrition are to be expressed, the words will enable the critic to judge; but of the degree of dignity, gravity, force, and originality of the composition, few but professors can judge in detail, though all of the general effect.

In hearing *dramatic music*, little attention is paid by the audience to any thing but the airs and powers of the principal singers; and yet, if the character, passion, and importance of each personage in the piece are not distinctly marked and supported; if the airs are not contrasted with each other, and the part of every singer in the same scene specifically different in measure, compass, time, and style, the composer is not a complete master of his profession.

Good singing requires a clear, sweet, even, and flexible voice, equally free from nasal and guttural defects. It is but by the tone of voice and articulation of words that a vocal performer is superior to an instrumental. If in swelling a note the voice trembles or varies its pitch, or the intonations are false, ignorance and science are equally offended; and if a perfect shake, good taste in embellishment, and a touching expression be wanting, the singer's reputation will make no great progress among true judges. If in rapid divisions the passages are not executed with neatness and articulation; or in adagios, if light and shade, pathos, and variety of colouring and expression are wanting, the singer may have merit of certain kinds, but is still distant from perfection.

Of *perfect performance on an instrument*, who can judge accurately but those who know its genius and powers, defects and difficulties? What is natural and easy on one instrument, is often not only difficult but impracticable on another. *Arpeggios*, for instance, which are so easy on the violin and harpsichord, are almost impossible on the hautbois and flute. And the rapid iteration of notes which give the violin player such little trouble, are impracticable on the harpsichord with the same finger. Those instruments of which the tone and intonation depend on the player, as the violin, flute, hautbois, &c. are more difficult than harps and keyed-instruments, where the player is neither answerable
for

for the goodness of the tone nor truth of intonation. However, there are difficulties on the harpsichord of another kind, to balance the account, such as the two hands playing two different parts in dissimilar motion at once, and often three or four parts with each hand. Of a good shake, a sweet tone, and neat execution, almost every hearer can judge; but whether the music is good or bad, the passages hard or easy, too much or too little embellished by the player, science and experience can only determine.

In *chamber music*, such as cantatas, single songs, solos, trios, quartets, concertos, and symphonics of few parts, the composer has less exercise for reflection and intellect, and the power of pleasing in detached pieces by melody, harmony, natural modulation, and ingenuity of contrivance, with fewer restraints, and fewer occasions for grand and striking effects, and expression of the passions, than in a connected composition for the church or the stage. Many an agreeable lesson, solo, sonata, and concerto, has been produced by musicians who would be unable to compose a *Te Deum* for voices and instruments, or to interest and satisfy an audience during a single act of an opera. We never have heard of Corelli, Geminiani, or Tartini attempting vocal melody, and the music merely instrumental of the greatest vocal composers is often meagre, common, and insipid. There are limits set to the powers of every artist, and however universal his genius, life is too short for universal application.

It was formerly more easy to compose than play an adagio, which generally consisted of a few notes that were left to the taste and abilities of the performer; but as the composer seldom found his ideas fulfilled by the player, adagios are now made more chantant and interesting in themselves, and the performer is less put to the torture for embellishments.

In 1752, Quantz classed quartettes at the head of instrumental music, calling them the touch-stone of an able composer; adding, that they had not yet been much in fashion. The divine Haydn, however, has since that time removed all kind of complaint on that account, having produced such quartets for number and excellence, as have never been equalled in any species of composition at any other period of time.

In composing and playing a solo, the least complicated of all music in parts, much knowledge, selection, invention, and refinement are necessary. Besides consulting the genius of the instrument and power of the performer, new, interesting, and shining passages must be invented, which will at once please and surprise the hearer, and do honour to the composer and performer. And who can judge of the originality of the composition, its fitness for the instrument, or degree of praise due to the performer, but those who have either studied composition, practised the same instrument, or heard an infinite variety of music and great performers of the same kind?

The famous question, therefore, of Fontenelle: "sonate, que veux tu?" to which all such recur as have not ears capable of vibrating to the sweetness of well-modulated sounds, would never have been asked by a real lover or judge of music. But men of wit of all countries being accustomed to admiration and reverence in speaking upon subjects within their competence, forget, or hope the world forgets, that a good poet, painter, physician, or philosopher, is no more likely to be a good musician without study, practice, and good ears, than another man. But if a lover and judge of music had asked the same question as Fontenelle; the Sonata should answer: "I would have you listen with attention and delight to the ingenuity of the composition, the neatness of the execution, sweetness

of the melody, and the richness of the harmony, as well as to the charms of refined tones, lengthened and polished into passion."

There is a degree of refinement, delicacy, and invention which lovers of simple and common music can no more comprehend than the Asiatics harmony. It is only understood and felt by such as can quit the plains of simplicity, penetrate the mazes of art and contrivance, climb mountains, dive into depths, or cross the seas in search of extraneous and exotic beauties, with which the monotonous melody of popular music has not yet been embellished. What judgment and good taste admire at first hearing, makes no impression on the public in general, but by dint of repetition and habitude. A syllogism that is very plain to a logician, is incomprehensible to a mind unexercised in associating and combining abstract ideas. The extraneous, and seemingly forced and affected modulation of the German composers of the present age, is only too much for us, because we have heard too little. Novelty has been acquired, and attention excited, more by learned modulation in Germany, than by new and difficult melody in Italy. We dislike both, perhaps, only because we are not gradually arrived at them; and difficult and easy, new and old, depend on the reading, hearing, and knowledge of the critic. The most easy, simple, and natural is new to youth and inexperience, and we grow nice and fastidious by frequently hearing compositions of the first class, exquisitely performed.

CRITONIA, in *Botany*, Gært. See KURNIA.

CRIVELLARI, BARTOLOMEO, in *Biography*, an engraver, born at Venice about the year 1725. He was much employed in that city by Wagner, for whom he engraved several plates. Some of the prints for the work entitled, "Istituto di Bologna," are likewise by him, particularly those four beautiful conversation-pieces from Niccolò del Abbati. Huber. *Manuel des Arts*.

CRIVELLI, ANGELO MARIA, a Milanese painter, celebrated for his skill in painting cattle. He was called Il Crivellone to distinguish him from his son Jacopo, who was a painter of birds and fishes. Angelo Maria died in 1730, Jacopo about the year 1760. Oriandi. Lanzi.

CRIVELLI, CARLO, a Venetian painter of the 15th century, who was the disciple of Jacobello del Fiore. He travelled many years, working wherever he came, and at length fixed his residence at Ascoli. His compositions are numerous, but the best of them are his small historical pictures, in which he introduces landscapes touched with great delicacy; nor are his figures void of grace or expression, though he was less correct as a designer than excellent as a colourist. Some of his pieces bear his name at length, and their respective dates from 1450 to 1474.

In the church of St. Sebastiano at Venice, is a figure of pope St. Fabiano in his pontifical habit, and the marriage of St. Catharine by the hand of this artist. Lanzi. Storia Pitt.

CRIVITZ, or KRIEWITZ, in *Geography*, a small town of Mecklenburgh Schwerin, in the ancient county of Schwerin, which in 1573 and 1660 suffered very much by conflagrations, the houses being mostly built with wooden frames, the interstices of which are filled with brick work.

CRIUMETOPON, in *Ancient Geography*, Asia, a promontory of the Tauric Chersonesus, and the most southern point of that peninsula.—Also, a promontory of the island of Crete.

CRIUS, a river of the Peloponnesus, in Achaia, which had its source in the mountains above Pallene, and discharged itself into the sea, before the town of Egyres, according to Pausanias.

CRIXIA, a town of Italy, in Liguria, situated between

Aquæ and Canalicum, according to the Itinerary of Antonine.

CRIZZELLING, in the *Glass Trade*, a kind of roughness arising on the surface of some kinds of glass. This was the fault of a peculiar sort of glass made in Oxfordshire, and some other places, of black flints, a crystallized sand, and a large quantity of nitre, tartar, and borax. The glass thus made is very beautiful, but, from the too great quantities of the salts in the mixture, is subject to *crizel*; that is, the salts in the mixture, from their too great proportion, are subject, either from the adventitious nitre of the air from without, or from warm liquors put in them, to be either increased in quantity, or dissolved, and thereby induce a scabiness, or roughness, irrecoverably clouding the transparency of the glass. This is what was called *crizzelling*; but by using an Italian white pebble, and abating the proportions of the salts, the manufacture is now carried on with advantage, and the glass made with these salts is whiter than the finest Venetian, and is subject to no faults. Plott's Oxfordshire, p. 258.

CROAGAN-KINSHELLY, in *Geography*, a mountain in the barony of Arklow, Ireland, elevated 1850 feet above the level of the sea.

CROAGH-PATRICK, or **CROW-PATRICK**, a mountain of the county of Mayo, Ireland, situated on the south of Clew-bay. This is by many esteemed the highest mountain in Ireland, rising in a conical form 2666 feet above the level of the sea. This mountain is celebrated by the natives as that from which St. Patrick drove all venomous beasts into the sea. On the summit there is an altar much frequented by Catholic pilgrims. Latocnaye's Rambles, &c.

CROAGHMORE, a mountain of Antrim county, Ireland, elevated 600 feet above the level of the sea.

CROARA, a town of Italy, in the duchy of Modena, 18 miles S.W. of Modena.

CROATIA, a country of Europe, situated between the 15th and 17th degree of E. longitude, and the 45th and 47th of N. latitude, belonging to the empire of Austria. It is a part of the ancient Illyricum. In the middle ages, Croatia, together with Dalmatia, formed a kingdom subject to the emperors of the East. This kingdom, in the eleventh century, devolved to Hungary. The Hungarians call it Horvath Orsozag. Zagrab or Angram on the river Save is the capital. An Austrian viceroy governs Croatia jointly with Slavonia and Hungarian Dalmatia.

Croatia extends from the river Drave to the Adriatic, about 80 miles in length, and 70 in breadth. It is bounded to the north by Slavonia, to the east by Bosnia, to the south by Dalmatia and the Adriatic, and to the west by the Austrian provinces of Stiria and Carniola. Its principal rivers are the Save and the Unna.

The whole country is divided into two parts: Croatia on this side of the Save, *Croatia Cissavana*, which is also called Upper Slavonia, and subdivided into five counties, and Croatia beyond the Save, *Croatia Transavana*, or Croatia Proper, which is subdivided into Hungarian or Military Croatia, and the Banat, *Banalis Croatia*, and Turkish Croatia, on the other side of the river Unna.

Military Croatia is one of the five principal divisions of the military frontiers of Austria in Hungary. This district commences at the most western corner of Dalmatia on the Adriatic, and runs through Croatia, Slavonia, the Banat of Temeswar, and Transylvania, into the Buccovina. This long tract of land, which surrounds Hungary on the south and on the east, has about 420,000 inhabitants, the fifth part of which is military. Keresyturi in his "Introductio," &c. Vienna, 1788, divides it into six districts, *viz.* Carlstadt,

which has four regiments; Banat, which has two; Warasdin, which has two; Slavonia, which has three; Banat of Temeswar, which has two; and Transylvania, which has three; in all sixteen regiments of infantry, of 3825 men, with 480 hussars attached to each regiment. The whole military frontier was formerly without any civil magistrates; but its military constitution has been abolished by the emperor Joseph II., and the Croats are now drafted into the regular regiments, like the rest of the subjects of Austria.

Croatia, according to Mr. de Lucca's Statistical Tables of 1793, contains 267,000 inhabitants, or 500 individuals per square mile.

CROATS, or **CROATIANS**, the inhabitants of Croatia, derive their origin from the Slavonians and Slavi, and settled in Croatia under the reign of the emperor Heraclius. Their ancient name was Hruatæ, or Hrouatæ, of which the Greeks made Chrobatæ. Of all the Illyrian nations they have the greatest affinity in their language with the Poles. Their manners, religion, and customs, are similar to those of the Slavonians and Transylvanians their neighbours. They are the successors of those *Daci*, or *Dacians*, who were at first the terror, and afterwards the strength, of the Roman armies; and have maintained their reputation for bravery in modern warfare, particularly in the seven years' war between Austria and Prussia, which terminated in 1763. The best general officers of the Austrian army, as Laudon, de Wied, and Kleefeldt, were formed in the Croatian regiments. Although the Croats have lost their ancient military constitution, they are still excellent soldiers, generally employed in the van and rear guards. They are also known by the name of **PAKDOURS**; which see.

CROBIALUS, or **CROBIALUM**, in *Ancient Geography*, a small town of Asia, situated near the Euxine sea, towards Paphlagonia.

CROBYZI, a people who occupied the district beyond the river Axius, according to Pliny, and the banks of the Ister, according to Steph. Byz. They were a people of Thrace, between mount Hæmus and the Euxine sea, according to Athenæus, and Ptolemy refers them to Lower Mœsia.

CROCALA, an island of sand, which Pliny and Arrian places near the mouth of the river Indus.

CROCALLIS, in *Natural History*, the name given by the ancients to a stone famous for its virtues against poisons, and venomous bites. All the description Pliny gives of it is, that it was of the size and shape of a cherry.

CROCARDS, an old name given by the Irish to a certain kind of money brought over into that kingdom from France, and other parts beyond the seas, and uttered there for pennies, though not really worth so much as a halfpenny. They were a small sort of coin, made of a mixture of copper, sulphur, and a small quantity of silver, and were called by several other names, as *mitris*, *lionines*, *rosaries*, and the like, from the figures they were impressed with. They were current in Ireland, and in some parts of England, a great many years; but were afterwards denied, and prohibited importation, both in England and Ireland, under the penalty of the forfeiture of life and effects. At this time, mints were set up in Dublin, for the coining of good money, and, in a few years, the whole quantity of the *crocards* was destroyed. See **POLLARDS**.

CROCE, **BALDASSARE**, in *Biography*, a Bolognese painter, born in the year 1553. He is generally said to have been the scholar of Annibale Caracci; but this is disputed by Baglione, who informs us, that so early as the pontificate of Gregory XIII, he was employed in several public works at Rome. The cupola of the church of Gesu

was painted by this artist; and in the church of S. Sufanna are several large stories in fresco by him, which are of a style natural and facile. Although he can scarcely be called the scholar of Caracci, it is probable that he benefitted by his example during the long sojourn of that great master at Rome. Croce died in 1628. Baglione.

CROCE, S. GIROLAMO DI, a painter of some eminence, of the Venetian school, who flourished at the commencement of the 16th century. He was one of the best imitators of the manner of Giorgione and of Titian. Many of his works are at Venice, amongst which, "The Last Supper," in the church of S. Martino, and "The Martyrdom of S. Lorenzo," a composition of many small figures, in the church of S. Francesco della Vigna, are worthy of notice. His works bear date from 1520 to 1549. Lanzi, Storia Pitt.

CROCE, S. PIETRO PAOLO DA, a painter who flourished at Padua, about the year 1591. Several of his pictures, evincing no small abilities, are to be seen in the churches of that city. Lanzi. Storia Pitt.

CROCEFISSAJO, DEL. See MACCHIETTI.

CROCHE, in *Geography*, a lake of N. America, in New South Wales, which is crossed in proceeding from Portage la Loche in a westerly direction of 6 miles, though its whole length may be twice that distance; after which it contracts to a river that runs westerly for 10 miles; when it forms a bend, which is left to the south, and entering a portion of its waters called the "Grass-river," whose meandering course is about 6 miles, but in a direct line not more than half that length, where it receives its waters from the Great river, which then runs westerly 11 miles before it forms the "Knee-lake," whose direction is to the north of west. It is full of islands for 18 miles, and its greatest apparent breadth is not more than 5 miles. The Portage of the same name is several hundred yards long, and over large stones. Its latitude is 55° 50' N. and longitude 106° 30' W. Two miles farther north is the commencement of the Croche Rapid, which is a succession of cascades for about 3 miles, making a bend due south to the lake du Primeau; which see.

CROCHE, Fr. the character in *Musick* which we call a *quaver*; which see.

CROCHES, among *Hunters*, the little buds about the top of a deer's horns.

CROCI, among *Botanists*, the apices, or small knobs, on the tops of flowers.

CROCIA, a bishop's or abbot's crozier, or pastoral staff. See CROSIER.

CROCIAS LAPIS, in *Natural History* a name given by some of the old authors to a species of agate, of a yellow colour, but deeper than the cerachates, or wax-coloured agate, and approaching to what is called a saffron colour.

CROCIATONUM PORTUS, in *Ancient Geography*, the capital of a people called *Uelli*, situated in the maritime part of Lyonnese Gaul, according to the table of Ptolemy. Ptolemy mentions it; and it is generally supposed to be the present Carantan.

CROCINUM, a name given by the ancient physicians to a sort of oil of saffron, which is thus described by Dioscorides.

Eight drams of saffron are to be put into three pints of inspissated oil, and they are to be stirred together several times in a day, for five days together; then the oil is to be separated from the saffron, and a like quantity is to be added to the same saffron, and stirred about at times for three days; then this oil is to be cleansed off, and to it are to be added fifty ounces of powdered myrrh. These having been well stirred together, are then to be set by for use.

Some used an oil, impreguated with aromatics, in the composition of the *crocinum*; but that was usually esteemed best, which smelt the most strongly of saffron, or else of myrrh.

The *crocinum* was esteemed heating and narcotic; whence it was frequently prescribed by way of embrocation, or else held in the nose in frenzies. It was also esteemed useful as a suppurative, and to cleanse old ulcers: it was much esteemed also in hardnesses, obstructions, and other disorders of the uterus, being used with wax, marrow, and double the quantity of oil; for a *glaucoma* it was also used with success, when mixt with water, and the eyes anointed frequently with it.

CROCKET, (from *croc*, French, a *hook* or *fork*;) one of the small ornaments which are usually placed all along the angles of pinnacles, and on the outside of pediments, canopies, tabernacles, and cupolas, in the pointed style of architecture. The first idea of these ornaments seems to have been taken from the buds seen upon the boughs of trees and plants in the spring season, which, in many early instances, they resemble. In their subsequent and more perfect form, they evidently represent the opening leaves of the oak or vine, or of some other tree or plant. Beautiful specimens of them may be seen in the works of Carter, Halfpenny, &c. See *GOTHIC* and *POINTED Architecture*.

CROCOCOLANA, in *Ancient Geography*, a town of the isle of Albion, on the route, according to Antonine's Itinerary, from Londinium to Lindum, or London to Lincoln, between Ad Pontem, near Southwell, and Lindum or Lincoln; 7 miles from the former, and 12 from the latter. The vestiges of this station, which are very faint, are described by Dr. Stukeley in his Itinerary. It is supposed to have been Brugh near Colingham.

CROCODILE, in *Zoology*, a species of lizard, being the largest of that kind; for a description and account of which, see *LACERTA Crocodilus*. *Crocodili* forms, in the arrangement of Gmelin, one of the general divisions of *lacerta*, characterised by a two-edged tail divided into segments, and a very short tongue.

CROCODILE, *fossile*. One of the greatest curiosities in the fossil world, which the late ages have produced, is the skeleton of a large *crocodile*, almost entire, found at a great depth under ground, bedded in stone. This was in the possession of Linkius, who wrote many pieces in natural history, and particularly an accurate description of this curious fossil. It was found in the side of a large mountain, in the midland part of Germany, and in a stratum of a black fossil stone, somewhat like our common slate, but of a coarser texture, the same with that in which the fossil fish of many parts of the world are found. This skeleton had the back and ribs very plain, and was of a much deeper black than the rest of the stone, as is also the case in the fossil fishes, which are preserved in this manner. The part of the stone where the head lay was not found, this being broken off just at the shoulders, but that irregularly, so that, in one place, a part of the back of the head was visible in its natural form. The two shoulder-bones were very fair, and three of the feet were well preserved; the legs were of their natural shape and size, and the feet preserved, even to the extremities of the five toes of each.

CROCODILE, CROCODILUS, in *Rhetoric*, a captious and sophistical kind of argumentation, contrived to seduce the unwary, and draw them speciously into a snare.

It has its name, *crocodile*, from the following occasion, invented by the poets. A poor woman, begging a *crocodile* that had caught her son walking by the river side, to spare and restore him, was answered that he would restore him, provided

provided she should give a true answer to a question he should propose: the question was, *Will I restore thy son or not?* To this the poor woman suspending a deceit, sorrowfully answered, *Thou wilt not:* and demanded to have him restored, because she had answered truly. Thou liest, says the crocodile: for if I restore him, thou hast not answered truly: I cannot therefore restore him, without making thy answer false. Under this head may be reduced the propositions called *mentiments*, or *insolubiles*; which destroy themselves. Such is that of the Cretan poet: *Omnes ad unum Cretenses semper mentiuntur: All the Cretans to a man, always lye.* Either then the poet lyes, when he asserts that the Cretans all lye, or the Cretans do not all lye.

CROCODILE Town, or *Meegheoun-yay*, in *Geography*, a town of Asia in the Buman empire, represented by lieutenant-colonel Symes, who visited it, as a place of considerable trade and importance. Its harbour contained no less than 100 large boats, and several smaller ones, lying at different stairs which took in rice, onions, garlic, and oil, for the consumption of the capita'. It stands on a very high bank, and has fewer religious buildings than any town which the colonel had seen of equal magnitude. In its vicinity are some neat farms, each containing 4 or 5 cottages, better built than houses in towns generally are, and fenced round with wide inclosures to receive the cattle, of which there was great abundance. The fields are divided by thorn-hedges; the low grounds prepared for rice; and the higher planted with leguminous shrubs, or left for pasture.

CROCODILIOIDES, in *Botany*, Vaill. See *ATRAC-TYLIS gummifera*.

CROCODILIVM, Juss. Vaill. See *CENTAUREA*.

CROCODILOPOLIS, in *Ancient Geography*, a town of Egypt, S.E. of the lake Moeris; the Greeks called it *Arsinoe*; and it is succeeded by the modern Faioum, built at the distance of about a league N. E. of its dilapidated walls. It derived its first name from the crocodiles which were fed and worshipped there. The prefecture of Arsinoe, says Strabo, reveres the crocodile, and looks upon it as sacred. The priests preserve one of them in a particular lake, and they nourish it with bread, flesh, and wine. Whilst the crocodile is reposeing himself on the banks of the lakes, the priests approach him; and whilst one opens his mouth, another puts cakes, flesh, and wine into it. After this repast the monster descends quietly into the water, and swims away. The Egyptians are said to have honoured the crocodile, because it was consecrated to Typhon, an evil genius whose fury they dreaded. They thought to calm his indignation, and avert the calamities with which he afflicted them, by honouring an animal which was his symbolical image. According to Diodorus (lib. i.) the crocodile was revered by the Egyptians upon account of their king, Menes, sometimes called Menes, and Manes. This prince, it is said, had been in great danger of being drowned; but was wafted through the waters to land by a crocodile. In memorial of this he built a city, which from this event was denominated the "city of the crocodile." This writer supposes that Menes really reigned over the Egyptians, because he stood at the head of their genealogical list; and he further imagines that the story was local, and that the event happened in the lake Moeris. The learned Bryant, (*Anal. Mythol.* vol. ii. p. 396.) supposes that Menes, the king of Egypt, was the Deus Lunus, and called also Mean, Men, and Man; and the legend about a crocodile was taken from some symbolical representation in the city of the same name; and hence it was supposed to have happened in Egypt. The crocodile had many names, one of which was Campsa, which signified an ark or receptacle; whence the purport of the hieroglyphic

is sufficiently manifest. The crocodile, according to Plutarch (Ius et Osiris) was equally a symbol of Typhon, and the deluge. See *LACERTA Crocodilus*.

CROCODILOPOLIS, another town of Egypt, in the Aphroditopolite nome, upon the left of the Nile, in the Thebaïd.—Also, a town of Asia, in Phœnicia, situated near, and to the south of, the town of Doræ, according to Strabo and Pliny.

CROCODILORUM LACUS, a lake of Palestine, or rather on the coast of Phœnicia, S. of Cæsarea, near which probably existed the town of the same name. This lake received the river Canz, which ran from mount Garizin.

CROCODILUS, a mountain of Asia, in Cilicia.

CROCODYLIUM, in *Botany*, Dalech. See *ECHINOPS Ritro*.

CROCOMAGMA, in *Pharmacy*, a name given by some to troches composed of saffron, myrrh, red roses, starch, and gum Arabic; thus called from *κροκος*, saffron, and *μαγμα*, a mass of any thing.

CROCOTTA, in *Natural History*, a name given by the ancients to a very fierce and terrible animal, produced by copulation between the large hyæna and the lioness. See *LEOCROCOTTA*.

CROCQ, in *Geography*, a small town of France, in the department of the Creule, chief place of a canton, in the district of Aubusson. It contains but 521, and the canton itself 920 inhabitants, dispersed in fifteen communes, upon a territorial extent of 260 kilometres.

CROCUS, in *Botany*, (from *כרוס*, or rather, as Kircher conjectures, it was originally read *כרכוס*, which occurs only in Solomon's Song, iv. 14. and is retained in the Septuagint with no variation, except in the form of the letters, *κροκος*; rendered in our English version saffron. As Solomon enumerates with it spikenard, calamus, and cinnamon, trees of frankincense, myrrh, and aloe, he probably intended by it one of the precious aromatics then imported into Judea from Arabia, and the remotest regions of the East, to furnish the toilets of the ladies in his splendid court. But Theophrastus and all the subsequent Greek and Latin writers clearly describe the crocus of Linnæus, and of modern gardeners.) Linn. Gen. 55. Schreb. 75. Willd. 92. Tourn. Cl. 9. § 2. gen. 1. Juss. 59. Vent. 2. 194. Class and order, *triandria monogynia*. Nat. Ord. *Enfataz*, Linn. *Irides*, Juss.

Gen. Ch. *Cal.* Spathe transparently membranous, one or two-leaved. *Cor.* Monopetalous, superior, funnel-shaped; tube very long, partly beneath the surface of the ground; border with six ovate oblong, nearly equal divisions. *Stam.* Filaments three, awl-shaped, shorter than the corolla, inserted into the tube. *Pist.* Germ inferior, roundish; style filiform; stigmas three, convolute, ferrate-crested. *Peric.* Capsule egg-shaped, trigonous, three-celled, three-valved. *Seeds* several, roundish.

Ess. Ch. Corolla tubular, six-parted, superior; stigmas three, convoluted.

Sp. 1. *C. sativus*, Linn. Sp. Pl. α officinalis. Poir. 3. Smith Fl. Brit. 39. Eng. Bot. 343. Wood. Med. Bot. tab. 176. Lam. Ill. tab. 30. fig. 1. Poir. 3. Willd. 1. Bauh. Pin. 65. Tourn. 350. (*C. officinalis*; Mart. Saffron.) "Stamens shorter than the pistil; style deeply trifid." Lam. "Stigma inserted, three-parted; segments linear." Smith. "Stigma three-parted, the length of the corolla, reflexed; leaves linear, revolute at the edges." Willd. *Root* bulbous, depressed. *Flower* very nearly or entirely sessile on the root; tube very long, white; segments of the border rich purple, elliptical, concave, regular. *Leaves* radical, invested with membranous sheaths, emerging after the flowers open, linear, slightly revolute, dark green above, with a white longitudinal furrow,

farrow; pale underneath, with a very prominent flattened mid-rib; style hanging out on one side between two of the segments of the corolla; stigmas deep orange, long, rolled in at the edges, notched at the summit. A native of Greece and Asia Minor. Its odorous aromatic stigmas are the saffron of the shops, for the sake of which it has been cultivated in its native countries from the earliest antiquity, and has long since been introduced into the western parts of Europe. In England it has given a distinguishing name to Saffron-Walden. See SAFFRON. 2. *C. scrotinus*. Salisb. Par. Lond. tab. 30. (*C. autumnalis*; Poir. 4. *C. alpinus autumnalis*; Bauh. Pin. 65. Tourn. 350. *C. montanum primum*; Cluf. Hist. 209. with a figure.) "Bractes two under the pericarp; (or in the language of Linnæus, spathe two-leaved;) border of the corolla slightly bearded; closed and pitcher shaped at the base; stigmas deeply multilobed." Salisb. *Root* bulbous, small, much depressed. *Leaves* radical, narrow, linear-awl-shaped, scarcely rolled in at the edges, appearing at the same time with the flower. *Flower* purple, or deep blue; tube rather short, a little enlarged towards the summit; divisions of the border lanceolate, deep; stamens little more than half the length of the border; anthers yellow, narrow, long, lanceolate, not arrow-shaped; stigmas very long, rising above the stamens, gradually enlarging upwards, crenulate or toothed at the summit. It is the latest of the autumnal crocuses, and in a mild season, and sheltered sunny situation, continues in flower till the beginning of December. A native of Spain, Portugal, Switzerland, and the south of France. 3. *C. nudiflorus*. Smith Flor. Brit. 41. Eng. Bot. 491. (*C. multifidus*; Poir. 5. *C. speciosus*; Von Bieberstein in Ann. Bot. 2. 404. *C. pyrenæum autumnale*; Cluf. Cur. Poët. 23. and Appen. alter. *C. autumnalis flore minore*; Bauh. Pin. 65.) "Stigma included in the flower, trifid; lobes multifid-laciniate, pencil-shaped; flower without leaves." Smith. *Root* bulbous, very small. *Flowers* purple-violet, opening early in October, and fading before the end of the month; stamens shorter than the divisions of the corolla; style longer than the stamens; stigmas orange-coloured, scentless. *Leaves* not appearing before December, more erect than those of the other species, paler, scarcely revolute at the edges. A native of the Pyrenées, and of Georgia, between the Terck and the Kur. In England it occurs sparingly in some old pastures and meadows, near Halifax, and in great profusion between Nottingham castle and the Trent, in a meadow annually overflowed by the river. In consequence of a negligent observation, it was at first mistaken by the writer of the article for *C. fativus*, and thence that plant was erroneously supposed to be a native of England. 4. *C. vernus*. Mart. 2. Poir. 1. Lam. Ill. Pl. 30. fig. 2. Willd. 2. Smith Fl. Brit. 40. Eng. Bot. Pl. 344. Jacq. Aust. App. tab. 36. β . Neapolitanus; Bot. Mag. 860. (*C. fativus* β ; Linn. Sp. Pl.) "Stigma included in the flower, trifid; lobes wedge-shaped, notched." Smith. *Root* bulbous, globular. *Scape* an inch or two high, almost triangular. *Flowers* generally purple, sometimes yellow or white; tube slender, very long, gradually enlarged towards the top; closed at the mouth by a ring of glandular entangled hairs; border campanulate; segments elliptic-lanceolate, much shorter than the tube; three inner ones smaller; anthers yellow, arrow-shaped. According to La Marck the stamens are longer than the pistils; but they are not so in his own figure to which he directly refers. A native of the Alps, Pyrenées, Italy, Spain, and Mount Atlas. In England it has been found only in the meadows between Nottingham castle and the Trent, growing with the preceding species, but always flowering in the spring. 5.

C. luteus. Lam. Ill. 2. Poir. 2. (*C. vernus*; Bot. Mag. 45. *C. vernus, latifolius, flavo flore*; Cluf. hist. 205. with a figure. *C. vernus, latifolius, flavus, flore majore*; Bauh. Pin. 66. Tourn. 352.) "Stamens longer than the pistil; border large, almost the length of the tube" *Roots* bulbous, roundish, a little depressed; enclosed in smooth, scarious, shell-like membranes, closely ribbed with fine parallel fibres, but not netted. *Leaves* radical, flat, narrow, linear, awl-shaped at the summit, longer than the corolla, with a white, rather large longitudinal rib. *Flowers* always yellow; tube slender, enlarged towards the summit; segments of the border oval-lanceolate, obtuse, erect; stamens shorter than the corolla; stigmas short, unequal, striated, thickened at the top, plaited and curled. A native of Switzerland, flowering in March, a little earlier than the preceding species. 6. *C. aureus*. Smith Prod. 85. Fl. Græc. tab. 35. (*C. vernus mæfiacus primum*; Cluf. Pann. 228.) "Stigma included in the flower, trifid; lobes nearly linear, finely toothed; tunic of the root membranous." A native of Thrace, found by Dr. Sibthorp near Scelus. 7. *C. fusianus*. Bot. Mag. Pl. 652. (*C. vernus latifolius flavo-vario flore*; Cluf. hist. 206. Bauh. Pin. 66.) "Few-flowered; bulb coarsely netted, with large irregular meshes; outer segments of the corolla constantly revolute near the tip; stigmas rising far above the anthers." A smaller plant than *C. luteus*, flowering earlier, and opening its flowers in all states of the weather. Received by Clusius from Constantinople, about the year 1587. 8. *C. biflorus*. improperly called the Scotch crocus by the English gardeners. Bot. Mag. Pl. 845. Bot. rep. Pl. 362. "Tunics of the bulb even surfaced, hard, circinate-imbriated; mouth of the tube naked." *Flowers* whitish; outer segments of the border marked on the outside with longitudinal purple streaks. Supposed to be a native of the East. 9. *C. sulphureus*. Bot. Mag. Pl. 938. (*C. vernus flavus striatus*; Park. par. 163. fig. 10. *C. vernus latifolius, flavo-vario flore*; Rai. hist. 1174. n. 8.) "Tunics of the bulb membranous, brown, thin, finely fibrous-striated; segments of the corolla spreading equally; anthers small, arrow-shaped, pale; stigmas unequal, rising far above the anthers." *Flowers* pale yellow; three outer segments of the corolla narrower, marked with three broadish dusky streaks which throw out lateral veins of the same colour; three inner ones broader, dark purple on the outside near the bottom; but marked with similar streaks. *Leaves* narrow, long, appearing before the flower. It never produces seeds in our climate, but propagates itself most profusely by off-sets. There is a permanent variety, in which the whole of the flower is of a uniform colour.

Obs. The crocus has been so long and so extensively cultivated, that it is not easy to distinguish the original species from the accidental varieties. The old botanists strove to make as many sorts as possible. C. Bauhin reckons twenty-nine; Tournefort, forty-six. Linnæus, on the other hand, reduces them all to one, and supposes the vernal and the autumnal, or officinal crocus, to be only varieties, notwithstanding the manifest difference in the form of their stigmas, leaves, and bulbs, as well as in the time of their flowering; very differently, as professor Martyn justly observes, from what he has done with respect to *Hemerocallis*, which he has divided into two species, though they differ only in their size, the colour of their flowers, and a little in the time of their flowering. Most modern botanists have thought the vernal and autumnal kinds specifically different, and several other species, apparently distinct, have gradually been added. Mr. Salisbury of Mill-hill, whose accuracy of observation, and acuteness of discernment, are well known, thinks he has ascertained

C R O C U S.

ascertained twelve well-ascertained species, but has not yet communicated his ideas concerning them to the public. See *Annals of Botany*, vol. i. p. 120.

CROCUS flore fructui imposito, tubo brevi; Roy. See *IXIA bulbocodium*.

CROCUS foliis & radice scorzonerae; Plum. See *HYPOXIS decumbens*.

CROCUS spatula diphylla; Linn. Sp. Ed. 1. See *IXIA bulbocodium*.

CROCUS sylvestris zeylanicus; Herm. Burm. See *MECYLON capitellatum*.

CROCUS vernus angustifolius quartus; Claf. See *IXIA bulbocodium*.

CROCUS, in *Gardening*, comprehends plants of the low flowering ornamental bulbous-rooted perennial kinds; of which, the sorts mostly cultivated, are the autumnal or common officinal *crocus*, and the spring *crocus*.

The first sort has a roundish bulbous root, as large as a small nutmeg, being a little compressed at the bottom, and covered with a coarse, brown, netted skin; having many long fibres sent out from the bottom of the bulb, which strike pretty deep into the ground; the flowers come out from the upper part of the root, which, with the young leaves, whose tops just appear, are closely wrapped about by a thin spathe or sheath, that parts within the ground, and opens on one side: the tube of the flower is very long, arising directly from the bulb without any foot-stalk, being divided at top into six segments which are equal, and of a purple blue colour. A roundish germ is situated in the bottom of the tube, which supports a slender style not more than half the length of the petal, being crowned with three oblong golden stigmas, spreading asunder each way, which constitutes the saffron. It flowers in October, and the leaves continue to grow all winter; but it never affords seeds in this climate.

Of this sort the varieties are chiefly the sweet-smelling, with a smaller and more compressed root, having a deep blue colour, but varying to a sky-blue;—the mountain, which has a flower of a pale blue colour;—the many-flowering blueish, with numerous sky-blue flowers; and the small-flowering, having a small deep blue flower.

The second kind has a pretty large compressed bulb, covered by a light brown netted skin, from which proceed four or five leaves of a purple colour on their lower parts, from among which issue one or two flowers, sitting close between the young leaves, and never rising above two inches in height, but having an agreeable odour. From the centre of the tube a slender style proceeds, which is crowned by a broad flat stigma of a golden colour. When the flower is past, the germ pushes out of the ground. The flower in the wild state is mostly white, with a purple base.

And of this kind, the varieties are; the broad-leaved purple variegated, which has a flower of a deep blue colour and striped;—the broad-leaved plain purple;—the broad-leaved violet-coloured, or large deep blue;—the white with a purple bottom;—the broad-leaved white variegated;—the broad-leaved, with many violet purple flowers, striped with white;—the broad-leaved ash-coloured;—the broad-leaved large yellow;—the broad-leaved small pale yellow;—the broad-leaved small yellow striped with black; the narrow-leaved small brimstone;—and the narrow-leaved small white. But in modern catalogues, there are many other varieties of different colours introduced, as blue and purple, yellow and white, or striped. New ones are also continually imported from Holland. The usual varieties at present in gardens are 1.—the beautifully striped Scotch;—the blue;

—the blue striped;—the white;—the yellow of several shades, larger and smaller;—the yellow striped with black;—the cloth of gold, &c.

Method of Culture.—The culture in both these sorts, and all the varieties, is easily effected, by planting the bulbs or off-sets taken from the roots; the first sort in July, or the beginning of the following month; and the latter any time when the weather is open, from September to the beginning of April in the following year; but the more early it is performed, the stronger they flower; it may be performed by means of a dibble or trowel, to the depth of about two inches, the ground being previously well dug over, and left some time to settle. They may be set either in beds by themselves in rows, at the distance of eight or nine inches, and six or eight inches apart, or in patches of five or six roots in each, on the fronts of the clumps, borders, or other parts of gardens and pleasure-grounds, putting them in, in a varied manner, both in respect to the sorts, and the order in which they are planted.

Where the soils are tolerably dry, they may remain two or three years without being disturbed; but should then be taken up at the time the leaves decay, in order to separate the new bulbs or off-sets for further increase, as well as new dig the ground. The larger bulbs should be separated from the small ones, and put up, each by themselves, in order to be planted out at the proper season; the former in the above manner, and the latter in beds, in rows six inches distant, to remain till they are of a proper size. See *BULBOUS ROOTS*.

As the bulbs increase fast, a large stock may, with care, soon be provided in this way. But when this is not practised, bulbs of the different species and varieties may easily be procured from the nursery and seeds-men.

It may be observed, that in the culture of these plants, great injury is frequently done by trimming off the green leaves at the time the flowers decline, in order to prevent litter; as by such means the future blow is rendered more weak and less beautiful.

Where new varieties are wanted recourse must be had to the seed, which must be sown in the spring season, either where the plants are to remain, in a bed of light mellow earth, or in pots filled with the same sort of earth.

The first species is the plant, which is cultivated in fields, and from the stigma of which the preparation known, under the title of English saffron, is made.

CROCUS, or *Saffron*, in the *Materia Medica*. The substance called saffron, is sold in the shops in the form of thin tough cakes, formed of the pistils of the flower, which are carefully picked by hand, pressed together, and gently dried in kilns. No other preparation whatever is employed. Saffron used to be cultivated pretty largely in England, and the neighbourhood of Saffron-Walden, in Essex, was celebrated for this substance, which was employed very largely in cookery and confectionary as well as in medicine; but, at present, it is scarcely used for the table, and but little as an article of the *Materia Medica*. In various parts of the continent it is still largely employed.

Saffron has a high orange red colour, readily staining the fingers when a little moist. The cakes should not be above a year old, close and tough in texture, neither so dry as to be pulverizable, nor so moist as to feel sensibly damp. The smell is very strong, fragrant, and penetrating, and the taste aromatic and bitter, but both are much injured by long or careless keeping. The fine yellow colour is readily imparted to almost any menstruum, to water, vinegar, alcohol, &c. and the intensity of tinging power is very great. The colour,

hour, however, is completely fugitive on exposure to air for some time, and is not permanently detained on cloth of any kind by any of the usual mordants, so that as a dye it is nearly useless, except to give a false and superficial finishing gloss to yellow or orange stuffs. Both the watery and acetous infusions lose most of their colour by keeping, but the spirituous tincture preserves its rich hue for a great length of time.

Saffron was formerly reckoned one of the most valuable and potent cordials which the *Materia Medica* possessed, raising the strength, spirits, and animal powers in a very high degree, when given in doses of no more than a few grains. These virtues, however, have been excessively exaggerated, nor does this medicine appear to have higher powers than many other of the aromatic bitters. This circumstance, added to the great and necessary costliness of a substance which requires so much manual employment in its preparation, has caused saffron to fall nearly into disuse, though it is still retained in a few of the compounds of the pharmacopœia. A syrup and tincture of saffron are often employed as grateful and elegant medicines.

Saffron yields, by distillation, a very pungent essential oil, and the residue is a bitter ungrateful extract.

Crocus of Antimony, is a perfect oxyd of this metal, formed by deflagration with nitre, and is called a crocus from its yellow colour. See *ANTIMONY*.

Crocus Martis. Several oxyds of iron have had this name given to them. Stahl's *aperient crocus of Mars* is formed by deflagrating with nitre the scorix of the martial regulus of antimony, which consists of sulphuret of iron retaining a small portion of antimony; and hence the crocus, or washed orange-powder, left after deflagration, consists of oxyd of iron mixed with a minute portion of oxyd of antimony. It is now disused.

The common *crocus martis*, or *colcothar*, is the deep orange red oxyd of iron left by calcination of the sulphat of iron, in a heat strong enough to expel all its acid.

CROCUTA, in *Zoology*, the quumberigo of Barbot, (Guin. p. 486.), and spotted hyæna of Pennant, is a species of *CANIS*, with a straight tail, four toes on the feet, and the body spotted with black. It inhabits Guinea, Ethiopia, Abyssinia, the Cape of Good Hope, and all the intermediate countries of Africa; living in holes of the ground and clefts of rocks. It preys by night on cattle, sheep, and horses, attacks men, and digs up graves to feed on dead bodies. It has a dreadful howling voice. The upper parts of the head and face are black; the mane short and black; the body and limbs covered with short soft hair, of a reddish-brown colour, marked with round black spots; the tail short and curly. This species is of such size, strength, and ferocity, that it can carry off, with great speed, a full-grown man. The head is large and flat, having fine long hairs above each eye, and very large whiskers on each side of the nose.

CROCYLEA, in *Ancient Geography*, a town and district which belonged, as some have supposed, to the island of Ithaca, but which really pertained to Etolia.

CROEKER, JOHN, in *Biography*, an artist, who was employed in England under queen Anne, and its two succeeding monarchs, to execute many medals upon public occasions. Amongst his works we may enumerate the following: A medal in commemoration of the Union of England and Scotland in 1707. Another medal, representing George II. and his family. A print of his own portrait exists, engraved by his own hand. Heinecken.

CROESUS, the fifth and last king of Lydia. He succeeded his father at about the age of thirty-five, which is dated B. C. 537. Almost immediately after he ascended

the throne, he gave himself up to plans of war and ambition, and by his great successes over the Grecian states and the kingdoms of Asia Minor, which he not only subdued but plundered, he became the richest and most powerful prince of his time. Wealth and power are, however, no security for happiness; in the midst of his glory, and when he had attained nearly the summit of his expectations, he lost his son Atys, who was killed in hunting. To wear off, if possible, the uneasiness which this misfortune excited in his mind, he determined to make war upon Cyrus; but before he engaged in so important an enterprise, in compliance with the customs of the age, he modestly consulted the most celebrated oracles. From that of Delphos, he obtained an answer, like others of the same kind, which admitted of two interpretations: "If Croesus crosses the Halys, he will put an end to a great empire." Croesus, depending on his own good fortune, expected from this to destroy the Persian monarchy, but Cyrus, its king, was destined for more important purposes. (See *CYRUS*.) He obtained a complete victory over the Lydian monarch, and Croesus was made prisoner, and would, probably, have lost his life, but from the extraordinary circumstance of his own son, who till then had been perfectly dumb, but who, on seeing a soldier about to kill his father, exclaimed, as if it were by divine inspiration, "Soldier, spare the King." We are told that the young man from this time had the use of his tongue. The fortune of Croesus, after this event, was various, and he had full leisure to reflect on the folly of trusting to wealth. In his prosperity, "the wealth of Croesus" was proverbial, and the king once invited Solon the wise to witness a display of his riches, hoping that the philosopher would deem him, as he concluded himself to be, the most fortunate man living; but Solon, to various interrogatories, replied, that "he deemed no man happy before his death." The prince was disconcerted, and dismissed the philosopher from his presence. When fortune had turned the scale, and he was about to be put to death at the command of Cyrus the conqueror, he recollected the saying of Solon, and thrice loudly called upon his name. Cyrus inquired into the cause, and when he had heard the relation, he pardoned the fallen monarch, took him into his favour, and made him his companion and counsellor in his several expeditions. Croesus survived his friend, who, in his last moments, recommended him to the particular care of his son Cambyfes, as one in whom he might place the most unlimited confidence. Cambyfes, however, treated him ill, and condemned him to death; from this cruel sentence he escaped, and history furnishes us with no clue whence his subsequent fortunes can be traced. *Univer. Hist. Plutarch's Life of Solon.*

CROEVER REICH, or *CROEFER Reiet*, in *Geography*, a small district of Germany, in the circle of the Upper Rhine, on the N. side of the Moselle, sold by the counts of Sponheim, in 1274, to the archbishop of Treves.

CROFT, in *Agriculture*, is a name often applied in the more northern districts to a small field or inclosure, mostly that in which the cottage, or house and garden are situated. It is, however, sometimes employed to signify a common field in particular districts. "Possunt etiam dicti monachi de eisdem mariscis versus occidentem jacentibus pro se, & hominibus suis, includere *croftos*, five pratum juxta pontem, specialiter, quantum illius placuerit." Ingulf. In some ancient deeds, *crofta* occurs as the Latin word for a croft; but *cum tofts & crofts* is more frequent. Croft is translated in *Abbo Floriacensis*, by *pradium*, a farm.

CROFT, HERBERT, in *Biography*, a prelate of the church of England, who flourished in the 17th century, was third

son of Sir Herbert Croft, and born in 1603, at Great Milton, Oxfordshire. In 1616, he was entered, it is believed, at Christ college, Oxford, from whence, on account of his father's conversion to the tenets of popery, he was sent to the English college of Jesuits at St. Omers, and entered into the order. Upon the death of his father, he had occasion to visit his native country, and was, by means of Dr. Morton, bishop of Durham, brought back to the religion in which he was originally educated. He went a second time to Oxford, and the time which he had spent at Douay was allowed to him, as if he had continued wholly at the English university. This was in 1635, when he went through the appointed exercises with applause, and in the following year was admitted to the degree of bachelor of divinity. He now rose rapidly in the church, and in 1641, was promoted to a canonry of Windsor. Three years after this he was appointed dean of Hereford, in which city he chiefly resided, until his zeal for royalty, and his attachment to the interests of the church, rendered him obnoxious to the existing government. His exertions in these services, which were attended with hazard, occasioned him to expend much of his own small fortune, as well the little which he derived from his preferments. His circumstances became embarrassed, but in 1659 he succeeded to the family estate, and was delivered from the pressure of want; he thought it prudent, however, to live in the most retired manner at a friend's house in Worcestershire, till the restoration, when he was re-instated in his several preferments, and in the year 1661 was promoted to the see of Hereford. From this time, he refused offers of more valuable bishoprics; and being disgusted with the profligate manners and intolerant practices of the court, he confined himself to the conscientious discharge of his duties as a bishop, which he performed with honour to his own character, and for the benefit of the church of which he was a member. Though zealously attached to his own opinions, he was the determined enemy of all persecution, wrote in defence of toleration, to be extended to dissenters, and pleaded the cause of humanity and Christian forbearance, with a zeal and manliness that reflect high honour on his principles, and the excellence of his temper. This work, which was intitled "Naked Truth; or the true State of the Church," excited much controversy. The bishop, shortly after, had formed a determination to quit his office and resign the bishopric, but was prevailed on to abandon the resolution, and to continue his episcopal labours till his death, which happened in 1691. He was author of several other pieces, among which were "Animadversions on a Book intitled the Theory of the Earth;" "The Legacy, &c. or a short Determination of all Controversies which we have with Papists, by God's Holy Word;" and "A Discourse concerning the reading his Majesty's Declaration in Churches." The learned prelate deserves higher applause as a man and a Christian than as a writer, though his pieces were respectable, considering the times in which he lived: but in his clerical character he was an admirable pattern, both with regard to the sanctity and amiableness of his manners, and the diligence with which he instructed his people, and visited the aged and the sick. His memory, however, claims particular respect on account of the moderation and candour which he exhibited towards those whose consciences would not permit them to conform to the established church, and his avowed abhorrence of every measure of the legislature which wore the least appearance of persecution. *Biog. Brit.*

CROFTING SYSTEM, in *Agriculture*, is that practice of grazing-farming in which the bullocks is conducted in small inclosures at no great distance from the farmer's house.

It has been lately recommended by Mr. Brown as an advantageous method to be adopted in some of the highland districts of Scotland; and might, probably, be pursued with benefit and success in particular situations in Wales.

CROFTON, ZACHARY, in *Biography*, a non-conformist preacher in the 7th century, was born at Dublin, where he received the principal part of his education. During the civil wars he came to England, but so destitute, that he is said to have arrived at Chelster with only four-pence in his pocket. He soon after obtained the living of Wrensbury in Cheshire; here, on account of his attachment to the cause of royalty, for refusing to subscribe "The Engagement," an instrument of the existing government, and exciting others to do the same, he was persecuted. He thought it right to seek a new course of life in the metropolis. Shortly after this he was presented with the living of St. Botolph, Aldgate, in which he continued till he was ejected under the act of uniformity. Soon after the restoration, he engaged in a controversy respecting the obligation of the "solemn league and covenant," for which he pleaded with so much zeal and freedom, that he provoked the indignation of the court, and was committed prisoner to the Tower, where he was detained, to the detriment of his fortune, which was very scanty, and to the injury of his family, which was numerous. He, at length, was liberated, and retired into Cheshire, where he was again imprisoned; but on his release, he first endeavoured to maintain his family by going into trade, and afterwards by becoming a farmer in the county of Bedford. In 1667, he came again to London, and opened a school at Aldgate, where he died, in 1672. He was author of many tracts on controversial subjects, and of sermons. *Calamy's Ejected Ministers.*

CROJA, in *Geography*, a town of European Turkey, in the province of Albania; anciently the capital and residence of the Albanian kings. The famous Scanderberg used this place as a fortress, from whence he continually harassed the Turks; but when the Turks became masters of Albania, they destroyed the fortifications. It is the see of a bishop, suffragan of the archbishop of Durazzo; 20 miles N.E. of Durazzo.

CROIDIT, and **CERVETTO** *the Younger*; for a parallel between thesetwo admirable performers, see **VIOLONCELLO**.

CROISADE, CRUSADE, or CRUSADO, a *holy war*, or an expedition against infidels and heretics; particularly against the Turks, for the recovery of Palestine. This expedition was distinguished, in the French language, by the name of a *croisade*, and all who embarked in it were called *croises*, because the end of this holy war was to arrest the cross of Christ out of the hands of the infidels, and also on account of the consecrated crosses of various colours, which the soldiers wore upon the right shoulder. They were ordered, as it is said, by the council of Clermont. The English wore them white; the French, red; the Flemish, green; the Germans, black; and the Italians, yellow.

People anciently flocked on these croisades out of devotion; the pope's bulls, and the preaching of the priests of those days, making it appear a point of conscience. Hence several orders of knighthood took their rise.

Many circumstances contributed to give rise to these expeditions. The desire of visiting a country which had been the scene of very important transactions, and in which the Son of God had accomplished the redemption of mankind, together with the idea of peculiar merit, acquired by a particular pilgrimage of this kind, and of its serving as a general expiation for almost every crime, had no small influence on this occasion. Besides, an opinion prevailed,

vailed, about the close of the 10th and beginning of the 11th century, that the thousand years mentioned by St. John, (Rev. xx. 2, 3, 4.) were accomplished, and that the end of the world approached; many thus hurried into the Holy Land, where they imagined that Christ would quickly appear to judge the world. Christians also thought it reproachful to suffer a country, which had been so signally distinguished, and whence they derived the most valuable benefits, to be abandoned to the enemies of the Christian name; and they thought it meritorious to avenge the calamities and injuries which its professors had suffered under the Mahometan yoke. Moreover, pilgrims were encouraged in their resort to Jerusalem, whilst Palestine continued subject to the caliphs; but when the Turks conquered Syria, about the middle of the eleventh century, they were exposed to every kind of outrage from these barbarians, and returned with exaggerated accounts of the dangers they had encountered in visiting the Holy City, and the cruelties and vexations they had endured. Accordingly, the first signal was given by Silvester II. towards the close of the tenth century, in an epistle wrote in the name of the church of Jerusalem to the church universal throughout the world, in which all the European powers are intreated and exhorted to succour and rescue the Christians in Palestine. This effort of zeal, however, produced no immediate effect. Gregory VII., in the beginning of the 11th century, revived an attention to this undertaking, proposed in person to invade the Holy Land, and upwards of 50,000 men were already mustered to follow him in this bold expedition. Although he was prevented by his quarrel with the emperor Henry IV. from executing this design, the spirit of the people was inflamed; and Peter the Hermit, returning from a voyage which he had made through Palestine, A. D. 1093, complained of the extreme sufferings of the Christians, applied to Urban II. for succour, and ran from province to province with a crucifix in his hand, exciting princes and people to this holy war, and pretending a divine commission for this purpose. At length, Urban II. finding a general ardour for the cause, assembled a grand and numerous council at Placentia, A. D. 1095, and warmly recommended this expedition. Soon after, in the same year, the proposal was renewed with success at the council of Clermont; at which were present, besides the papal court and council of Roman cardinals, 13 archbishops, 25 bishops, 400 mitred prelates, a great number, some say 4000, of ecclesiastics, and three hundred thousand laymen. In the market place of Clermont, the pope (Urban II.) ascended a lofty scaffold and addressed his eloquence to a well-prepared and impatient audience. Such was the success with which he addressed a numerous multitude, that he was interrupted by the clamorous shouts of thousands who with one voice exclaimed, "*Deus vult; Deus vult!*" "God wills it; God wills it!" "It is indeed the will of God," replied the pope; "and let this memorable word, the inspiration surely of the Holy Spirit, be for ever adopted as your cry of battle, to animate the devotion and courage of the champions of Christ. His cross is the symbol of your salvation; wear it; a red, a bloody cross, as an external mark on your breasts or shoulders, as a pledge of your sacred and irrevocable engagement." The proposal was joyfully accepted; and if we may believe the concurring testimony of contemporary authors, six millions of persons assumed the cross, as the distinguishing badge of those who devoted themselves to this holy warfare. The fumes of this enthusiastic zeal did not evaporate at once; the frenzy was as lasting as it was extravagant. During two centuries Europe seems to have

had no object but to recover or keep possession of the Holy Land, and through that period vast armies combined to march thither.

The number need not astonish us, if we consider that it was a motley assemblage of monks, prostitutes, artists, labourers, lazy tradesmen, merchants, boys, girls, slaves, malefactors, and profligate debauchees; and that it was principally composed of the lower dregs of the multitude, who were animated solely by the prospect of spoil and plunder, and hoped to make their fortunes by this holy campaign.

Besides, we shall have no reason to wonder at the multitude who flocked to the standard of the cross, if we advert to the natural operation of frantic zeal and the numberless privileges which the Crusaders acquired. Many or perhaps the greatest number of the chiefs and soldiers we may naturally suppose were prompted by the spirit of enthusiasm; the belief of merit, the hope of reward, and the assurance of divine aid. But it is equally certain that with many this was not the sole, and that with some it was not the leading, principle of action. In the council of Clermont, pope Urban had proclaimed a plenary indulgence to those who should enlist under the banner of the cross; the absolution of all their sins, and a full receipt for all that might be due of canonical penance. Moreover, the extensive privileges and immunities, granted to those who assumed the cross, will serve to account for the first ardour and long continuance of the Crusading spirit in Europe. The Crusaders were exempted from prosecutions on account of debt, during the time of their being engaged in this holy service.—They were exempted from paying interest for the money which they had borrowed.—They were exempted either entirely, or at least during a certain time from the payment of taxes.—They might alienate their lands without the consent of the superior lord of whom they held.—Their persons and effects were taken under the protection of St. Peter, and the anathemas of the church were denounced against all who should molest them, or carry on any quarrel or hostility against them, during their absence, on account of the holy war.—They enjoyed all the privileges of ecclesiastics, and were not bound to plead in any civil court, but were declared subject to the spiritual jurisdiction alone.—And as we have already observed, they were promised a plenary remission of all their sins, and the gates of heaven were set open to them, without requiring any proof of their penitence by their engaging in this expedition, and thus gratifying their favourite passion, the love of war. (Du-Cange.) Besides, the civil and ecclesiastical powers vied with one another, and strained their invention to devise expedients for encouraging and strengthening the spirit of superstition, and in setting a mark of cowardice and infamy on those who declined engaging in the holy war. In a letter addressed from Stephen, the earl of Chartres and Blois, to Adela his wife, in which he gives an account of the progress of the crusaders, he describes them as the chosen army of Christ; as the servants and soldiers of God; as men who marched under the immediate protection of the Almighty, being conducted by his hand to victory and glory. He speaks of the Turks, on the other hand, as accursed, sacrilegious, and devoted by heaven to destruction; and when he mentions the soldiers in the Christian army who had died or were killed, he is confident that their souls were admitted directly into the joys of paradise. Actuated and animated by such views, the crusaders embarked in this frantic expedition with singular ardour, and submitted without reluctance to the inconvenience and enormous expence that attended it. That the expence of conducting

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Mustering numerous bodies of men from Europe to Asia must have been excessive, and that the difficulty of raising the necessary sums for this purpose must have been proportionably great, we may infer from the expedients to which the leaders of this expedition were obliged to recur, during ages when the public revenues in every nation of Europe were extremely small. Hubert II. dauphin of Vienne, was obliged to furnish himself with money towards defraying the expense of the crusade. A. D. 1346, by very extraordinary sacrifices and concessions. He exposed to sale part of his domains; and the French king, in this sacred service, gave his consent and ratified the alienation. Moreover, he issued a proclamation, in which he promised to grant new privileges to the nobles, as well as new immunities to the cities and towns, in his territories, for certain sums which they were instantly to pay on that account; and, in this manner, many charters of community were obtained. He exacted also a contribution towards defraying the charges of the expedition from all his subjects, both ecclesiastics and laymen, who did not personally accompany him to the East. He appropriated a considerable part of his usual revenues for the support of the troops to be employed in this service: and he exacted considerable sums, not only of the Jews settled in his dominions, but also of the Lombards and other bankers who had fixed their residence there. Notwithstanding all these resources, he was involved in difficulties, which, on his return, required fresh exactions and demands. When the count de Fois engaged in the first crusade, he raised the money necessary for that expedition, by alienating part of his territories. In like manner, Baldwin, count of Hainaut, mortgaged or sold part of his dominions, to the bishop of Liege, A. D. 1096. And, at a later period, A. D. 1239, Baldwin, count of Namur, sold part of his estate to a monastery, when he intended to assume the cross.

Early in the spring of the year 1096 above 60,000 of the populace of both sexes from the confines of France and Lorraine assembled and put themselves under the conduct of Peter the Hermit, and followed him along the banks of the Rhine and Danube. The example and footsteps of Peter were closely pursued by another fanatic, the monk Godefcal, whose sermons had swept away 15 or 20 thousand peasants from the villages of Germany. Their rear was again pressed by an herd of 200,000, the most stupid and savage refuse of the people, who mingled with their devotion a brutal licence of rapine, prostitution, and drunkenness. Some counts and gentlemen joined the motley multitude with a view of sharing in the spoil. The first attacks of these enthusiasts were directed against the Jews, who were numerous and rich in the trading cities of the Moselle and Rhine, and who enjoyed, under the protection of the emperor and the bishops, the free exercise of their religion. At Verdun, Treves, Mentz, Spire, and Worms, many thousands of these unhappy people were pillaged and massacred. As these crusaders advanced to the wild and desolate countries of Hungary and Bulgaria, and traversed an interval of 600 miles, they endured incredible hardships. About a third of the naked fugitives, and among them the hermit Peter, escaped from the attacks of the Hungarians to the Thracian mountains; and the emperor, who respected the pilgrimage and succour of the Latins, conducted them by secure and easy journies to Constantinople, advising them to await the arrival of their brethren. Here, however, regardless of the kindness of their benefactor, neither gardens, nor palaces, nor churches, were safe from their depredations. Alexius, therefore, for his own security, allured them to pass over to the Asiatic side of the Bosphorus; but their blind impetuosity urged them to rush precipitately against the Turks;

who occupied the road of Jerusalem. Soliman, by spreading a rumour that some of their companions were rioting on the spoils of his capital, tempted the main body to descend into the plain of Nice, where they were overwhelmed by the Turkish arrows; and where a pyramid of bones informed their companions of the place of their defeat. Of the first crusaders 300,000 had already perished, before a single city was rescued from the infidels, and before their graver and more noble brethren had completed the preparations of their enterprise. None of the great sovereigns of Europe embarked their persons in the first crusade; but the religious ardour more strongly operated on the princes of the second order, who held an important place in the feudal system. The first rank both in war and council is justly due to Godfrey of Bouillon, a descendant of Charlemagne in the female line. He was accompanied by his two brothers, Eustace, the elder, and Baldwin, the younger; the duke of Lorraine, and the barons of France, Germany, and Lorraine, who assembled their vassals. The confederate force that marched under the banner of Godfrey was composed of 80,000 foot, and about 10,000 horse. Among the heads of the early crusaders we may also mention Hugh of Vermandois, Robert duke of Normandy, the eldest son of William the Conqueror, Robert count of Flanders, surnamed the Sword and Lance of the Christians, and Stephen, count of Chartres, Blois and Troyes, one of the richest princes of the age, the number of whose castles is said to have amounted to the 365 days of the year. These four were the principal leaders of the French, the Normans, and the pilgrims of the British isles: but the list of the barons, who were possessed of 3 or 4 towns, would exceed, says a contemporary, the catalogue of the Trojan war. Raymond of Toulouse, and Adhemar, bishop of Puy, and legate of the pope, assumed the command in the south of France; and the united force consisted of 100,000 horse and foot. Bohemond, the son of Robert Guiscard, at the head of 10,000 horse, and 20,000 foot, was accompanied by several princes of the Roman race, and also by his cousin Tancred.

The difficulty of procuring subsistence for such an incalculable multitude of men and horses, induced these several leaders to separate their forces; and they agreed to meet at last in the neighbourhood of Constantinople, and thence to begin their military operations against the Turks. Godfrey of Bouillon, departing from the banks of the Meuse and Moselle, pursued the direct way of Germany, Hungary, and Bulgaria. From Austria to Belgrade, they traversed the plains of Hungary without enduring or offering any injury; with the same conduct and discipline, he pervaded the woods of Bulgaria and the frontiers of Thrace; and he almost reached the first term of his pilgrimage, without drawing his sword against a Christian adversary. After an easy and pleasant journey through Lombardy, from Turin to Aquileia, Raymond and his provincials marched 40 days through the savage country of Dalmatia and Scythia; and his march between Durazzo and Constantinople was somewhat harassed, without being stopped, by the peasants and soldiers of the Greek emperor. From the Alps to Apulia the march of Hugh the Great, of the two Roberts, and of Stephen of Chartres, through a wealthy country, and amidst the applauding catholics, was a devout and triumphant progress; they kissed the feet of the Roman pontiff; and the golden standard of St. Peter was delivered to the brother of the French monarch. All separately accomplished their passage, regardless of safety or dignity, and within 9 months from the feast of the Assumption, August the 15th, 1096, the day appointed by Urban, all the Latin princes had reached Constantinople.

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The principal force of the crusaders consisted in their cavalry; and when that force was mustered in the plains of Bithynia, the knights and their martial attendants on horseback amounted to 100,000 fighting men, completely armed with the helmet and coat of mail. The whole number, that formed the infantry and promiscuous crowd, was composed of 600,000 pilgrims, able to bear arms, and priests, monks, women, and children. It is farther said, that if all who took the cross had accomplished their vow, above *six millions* would have emigrated from Europe to Asia. Of these religious volunteers great numbers never beheld Constantinople and Nice. Some declined the enterprise in consequence of the transitory duration of their enthusiasm; others through cowardice, and others again on account of their poverty or weakness. Many fell in the savage countries of Hungary and Bulgaria; their vanguard was cut in pieces by the Turkish sultan; and we have stated the loss of the first adventure by the sword, or climate, or fatigue, at 300,000 men.

The first efforts of these adventurers were irresistible, and they gained considerable advantages. From their first station in Nicomedia, they advanced, from May 14th, to June 20, A. D. 1097, in successive divisions; passed the contracted limit of the Greek empire; opened a road through the hills; and commenced their pious warfare against Soliman, the Turkish sultan, by the siege and capture of Nice, his capital. Soliman, provoked rather than dismayed by the loss of his capital, collected his Turkman horde, constituting a force which is stated by the Christians at 200, or even 300, thousand horse. A severe engagement took place at Dorylaeum, in Phrygia, July 4th, A. D. 1097, which terminated in victory on the part of the crusaders, and the hasty retreat of the sultan, who evacuated the kingdom of Roum. In a march of 500 miles, from July to September, the crusaders traversed the Lesser Asia, through a desolate land, and deserted towns, without finding either a friend or an enemy, encountering in every step of their progress a great variety of difficulties and hardships. A detachment from the main army over-ran in a rapid career the hills and sea-coast of Cilicia, from Cogni to the Syrian gates; the Norman standard was first planted on the walls of Tarsus and Malmistra; and after a private conflict between Baldwin and Tancred, the former took possession of Edessa, and founded the first principality of the Franks or Latins, which subsisted 54 years beyond the Euphrates. During the ensuing winter the siege of Antioch, the capital of Syria, was commenced, and after an attack and defence equally obstinate, the city was surprisèd in the night; the army rushed in through the gates; and the Moslems soon found that resistance would be impotent and unavailing. The citadel still refused to surrender; and the victors were encompassed and besieged by the innumerable forces of Kerboga, prince of Mosul. In this extremity they collected the relics of their strength, sallied from the town, and in a single memorable day (June 28th, A. D. 1098), annihilated or dispersed the host of Turks and Arabians, consisting of 600,000 men. The attack of Jerusalem was suspended above ten months after the defeat of Kerboga; for the crusaders, after the victory they had obtained, hastily disordered to enjoy the luxury of Syria. By the siege of Antioch, and subsequent battle, as well as by famine and sickness, their numbers had been greatly diminished, and their strength enfeebled; however, in the month of May, A. D. 1099, the relics of their mighty host proceeded from Antioch to Laodicea; about 40,000 Latins, of whom no more than 1500 horse, and 20,000 foot, were capable of immediate service. Their easy march was continued be-

tween mount Libanus and the sea-shore; their wants were liberally supplied by the coasting traders of Genoa and Pisa; and they drew large contributions from the cities of Tripoli, Tyre, Sidon, Acre, and Caesarea, which granted a free passage, and promised to follow the example of Jerusalem. From Caesarea they advanced into the midland country, recognising in their progress Lydda, Ramla, Emmaes, and Bethlehem; and as soon as they descried the Holy City, the crusaders forgot their toils, and claimed their reward. The garrison is said to have consisted of 40,000 Turks and Arabians, under the command of Aladin or Istikhar, the lieutenant of the caliph, with whom the defence of the city was entrusted. The siege commenced on the 7th of June, A. D. 1099, and was directed against the northern and western sides of the city. Godfrey of Bouillon erected his standard on the first swell of mount Calvary; to the left, as far as St. Stephen's gate, the line of attack was continued by Tancred, and the two Roberts; and count Raymond established his quarters from the citadel to the foot of mount Sion, which was no longer included within the precincts of the city. On the 5th day, the crusaders made a general assault, with the fanatic hope of battering down the walls without engines, and of scaling them without ladders. By dint of brutal force, they burst the first barrier; but they were driven back with shame and slaughter to the camp. The siege was prolonged for 40 days; and they were 40 days of calamity and anguish, during which they endured distressing privations of food and water. Having constructed two turrets, they were rolled to the most accessible, and most neglected, parts of the fortification. One of them was unfortunately reduced to ashes by the fire of the besieged; but by means of the other, the enemies were driven by archers from the rampart; the drawbridge was let down; and on Friday at three in the afternoon, the day and hour, as it is said, of the passion, Godfrey of Bouillon stood victorious on the walls of Jerusalem. His example was followed on every side by the emulation of valour; and about 460 years after the conquest of Omar, the Holy City was rescued from the Mahometan yoke. The victors, to their everlasting disgrace, indulged themselves three days in a promiscuous massacre; so that the infection of the dead bodies occasioned an epidemical disease. After 70,000 Moslems had been put to the sword, and the harmless Jews had been burned in their synagogue, they reserved a multitude of captives; and Raymond granted a capitulation and safe-conduct to the garrison of the citadel.

"The holy sepulchre was now free; and the bloody victors prepared to accomplish their vow. Bare-headed and bare-foot, with countenances, and in an humble posture, they ascended the hill of Calvary, amidst the loud anthems of the clergy; kissed the stone which had covered the Saviour of the world; and bedewed, with tears of joy and penitence, the monument of their redemption."

Eight days after this memorable event (July 23, A. D. 1099), the Latin chiefs proceeded to the election of a king, to guard and govern their conquests in Palestine; when the free, just, and unanimous voice of the army proclaimed Godfrey of Bouillon the first and most worthy of the champions of Christendom. His magnanimity accepted a trust as full of danger as of glory; but in a city where his Saviour had been crowned with thorns, the devout pilgrim rejected the name and ensigns of royalty; and the founder of the kingdom of Jerusalem contented himself with the modest title of "Defender and Baron of the Holy Sepulchre." Within a fortnight after his acceptance of this honour, he was called to the field of battle by the approach of the vizir or sultan of Egypt, who was totally vanquished in the battle of Ascalon,

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Ascalon, Aug. 12, A. D. 1099. This victory sealed the establishment of the Latins in Syria, and signalized the valour of the French princes, who in this action bade a long farewell to the holy wars. Godfrey could retain, after this battle, only with the gallant Tancred 300 knights, and 2000 foot soldiers, for the defence of Palestine. Soon after this, a new enemy attacked his sovereignty, who sprung out of the bosom of the church. The seditious clamours of the ecclesiastics were urgent for the choice of a bishop, which, in their opinion, should have preceded that of a king. At this time Daimbert, archbishop of Pisa, seasonably arrived, with a fleet of his countrymen, for the service of the Holy Land; and he was immediately installed, without a competitor, the spiritual and temporal head of the church. The new patriarch instantly grasped the sceptre which had been acquired by the toil and blood of the victorious pilgrims; and both Godfrey, and Bohemond, who had claimed the sovereignty of Antioch as the recompence of his services during its siege, and in obtaining its surrender, submitted to receive of the hands of Daimbert the investiture of their feudal possessions. Daimbert further claimed the immediate property of Jerusalem and Jaffa; and a quarter of either city was ceded to the church; and the modest bishop was satisfied with an eventual reversion of the rest, on the death of Godfrey without children, or on the future acquisition of a new seat at Cairo or Damascus. This infant kingdom consisted only of Jerusalem and Jaffa, with about 20 villages and towns of the adjacent country. By the arms of Godfrey himself, and of the two Baldwins, his brother and cousin, who succeeded to the throne, the boundaries of this kingdom were enlarged. After the reduction of the maritime cities of Laodicea, Tripoli, Tyre, and Ascalon, the range of seacoast from Scanderoon to the borders of Egypt, was possessed by the Christian pilgrims. The counts of Edessa and Tripoli owned themselves the vassals of the king of Jerusalem. The Latins reigned beyond the Euphrates; and the four cities of Hems, Hamah, Damascus, and Aleppo, were the only relics of the Mahometan conquests in Syria. The new government was framed, and the laws and language, the manners and titles, of the French nation, and Latin church, were introduced into these transmarine colonies. However, the firmest bulwark of Jerusalem was founded on the knights of the hospital of St. John, and of the temple of Solomon. These knights maintained their fearless and fanatic character; and the spirit of chivalry, which was both the parent and offspring of the crusades, was transplanted by this institution from the holy sepulchre to the isle of Malta. As soon as Godfrey of Bouillon was seated in the office of supreme magistrate, he solicited the advice of the Latin pilgrims, who were best skilled in the statutes and customs of Europe, and from the materials which they furnished, with the counsel and approbation of the patriarch and barons, of the clergy and laity, Godfrey composed the "Assise of Jerusalem," which is a precious monument of feudal jurisprudence. The final revision of this code was accomplished in the year 1369, for the use of the Latin kingdom of Cyprus. The justice and freedom of the constitution were maintained by two tribunals of unequal dignity, instituted by Godfrey of Bouillon, after the conquest of Jerusalem. The king presided in person in the upper court, the court of the barons; the nobles, who held their lands immediately of the crown, were entitled and bound to attend the king's court; and each baron exercised a similar jurisdiction in the subordinate assemblies of his own feudatories. The connection of lord and vassal was voluntary and honourable. The cognizance of marriage and testaments was blended with religion, and

usurped by the clergy; but the civil and criminal causes of the nobles, the inheritance and tenure of their fiefs, formed the proper occupation of the supreme court. Each member was the judge and guardian of both public and private rights. The Assise of Jerusalem admits, in many cases, the barbarous institution of judicial combat. The trial by battle was established in all criminal cases, which affected the life, or limb, or honour, of any person; and in all civil transactions, of or above the value of one mark of silver. Champions were only allowed to women, and to men maimed, or past the age of 60. In the Assise of Jerusalem it is expressly declared, that after instituting, for his knights and barons, the court of peers, in which he presided himself, Godfrey established a second tribunal, in which his person was represented by his viscount. This court extended its jurisdiction over the burgesses of the kingdom; and it was composed of a select number of the most discreet and worthy citizens, who were sworn to judge, according to the laws, of the actions and fortunes of their equals. In the conquest and settlement of new cities, the example of Jerusalem was imitated by the kings and their great vassals; and above 30 similar corporations were founded before the loss of the Holy Land. These cities and corporations, if those of Palestine were coeval with the first crusade, may be ranked with the most ancient of the Latin world. (See CITY and CHARTERS of Community.) A third court was established for the use of those Syrians and oriental Christians who were oppressed by the zeal of the clergy, and who wished to be judged by their own national laws. Its jurisdiction was limited and domestic; its sworn members were Syrians, in blood, language, and religion; but the office of the president was sometimes exercised by the viscount of the city. At an unmeasurable distance below the nobles, the burgesses, and the strangers, the Assise of Jerusalem condescends to mention the villeins and slaves, the peasants of the land, and the captives of war. The relief or protection of these unhappy men was not esteemed worthy of the care of the legislator; but he diligently provides for the recovery, though not indeed for the punishment, of the fugitives.

In the 12th century, there were considerable bodies of emigrants who marched by land from the West to the relief of Palestine. The soldiers and pilgrims of Lombardy, France, and Germany, were excited by the example and success of the first crusade. Forty-eight years after the deliverance of the holy sepulchre, the emperor Conrad III. and the French king, Louis VII., undertook the second crusade to support the falling fortunes of the Latins. This expedition was undertaken at the instigation of Bernard, abbot of Clairval, and under the pontificate of Eugenius III.; A. D. 1147. Conrad and Louis met at Nice, and proceeded to Jerusalem, A. D. 1148, from whence they led back into Europe the miserable remains of those troops which had survived the disaster that had occurred in this expedition. Its unhappy issue has been ascribed principally to the jealousies and divisions that prevailed among the Christian chiefs in Palestine. Nor was it more ineffectual in Palestine than detrimental to Europe, by draining the wealth of its fairest provinces, and destroying such a prodigious number of its inhabitants. The third crusade was undertaken, A. D. 1189, by Frederic I., surnamed Barbarossa, emperor of Germany, whose example was followed, A. D. 1190, by Philip Augustus, king of France, and Richard Cœur-de-lion, king of England. These two monarchs arrived in Palestine in the year 1191, and succeeded in their first encounters with the infidels. After the reduction of Acre or Ptolemais, the French monarch returned to Europe; and the king of England, who remained, pushed the war with

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great vigour, and not only defeated Saladin in several engagements, but made himself master of Jaffa and Cæsarea. Deserted, however, by the French and Italians, and influenced by other weighty considerations, he concluded, A.D. 1192, with Saladin a truce of 3 years, 3 months, and 3 days, and soon evacuated Palestine with his whole army. A *fourth* crusade, if it may be so called, was undertaken by the Teutonic knights, in consequence of the miseries which the besiegers suffered at the siege of Acre, and at the intimation, or at least with the marked approbation of pope Celestin III., who confirmed the above-mentioned order by a bull issued on the 23d of February, A.D. 1192. The support of Christianity, the defence of the Holy Land, and the relief of the poor and needy, were the important duties and services to which the Teutonic knights devoted themselves by a solemn vow. The *fifth* crusade, A.D. 1198, was excited by an illiterate priest of the neighbourhood of Paris, Fulk of Neuilly, who deserted his parochial duty, in order to assume the more flattering character of a popular and itinerant missionary. No sooner did Innocent III. ascend the chair of St. Peter, than he proclaimed in Italy, Germany, and France, the obligation of this new crusade. The eloquent pontiff described the ruin of Jerusalem, the triumph of the Pagans, and the shame of Christendom: his liberality proposed the remission of sins, a plenary indulgence to all who should serve in Palestine, either a year in person, or two years by a substitute; and among his legates and orators who blew the sacred trumpet, Fulk of Neuilly was the loudest and the most successful. Although the principal monarchs of that period, the emperor Frederick, Philip Augustus of France, and Richard of England, were on account of their peculiar circumstances not much inclined to engage in this expedition; nevertheless the preacher was heard and obeyed by the great vassals, the princes of the second order; and the foremost in the holy race was Theobald, or Thibaut the young count of Champagne. His companion in arms was Louis, count of Blois and Chartres; and they were joined by a crowd of prelates and barons, who imitated their zeal, and whose names it is needless to mention. The operations of the war were debated in full and frequent assemblies; and it was resolved to seek the deliverance of Palestine in Egypt, a country, which, since Saladin's death, was almost ruined by famine and civil war. But as the French barons who took the lead in this business were destitute of ships and ignorant of navigation, they dispatched 6 deputies to Venice, to solicit, on motives of piety or interest, the aid of that powerful republic. The deputies were hospitably received; and after much deliberation and debate, they were authoritatively informed that they would assist them on certain conditions, which they proposed. They offered a considerable number of flat-bottomed boats and ships for the use of their horses and foot-soldiers, to supply them with provisions for nine months, and to join the armament with a squadron of 50 galleys. But they required, that the pilgrims should pay, before their departure, a sum of 85,000 marks of silver; and that all conquests by sea and land, should be equally divided between the confederates. The treaty was ratified and preparations were made for the departure of the crusade. About the festival of Pentecost, A.D. 1203, Boniface, marquis of Montserrat, to whom the conduct of the enterprise was committed, displayed his banner and marched towards Venice at the head of the Italians; he was attended and followed by the counts of Flanders and Blois, and the most respectable barons of France; and their numbers were swelled by the pilgrims of Germany, who were actuated by views and motives similar to their own. The Ve-

netians fulfilled their engagements. After obviating some difficulties that occurred in their negotiation, the fleet and army directed their first hostilities against Zara, a strong city in Scлавonia, which had renounced its allegiance to Venice, and implored the protection of the king of Hungary. This city was soon compelled to surrender; but this commencement of their military career occasioned great disgust and complaint. The pope excommunicated the false crusaders, who had pillaged and massacred their brethren, the Hungarians, actually enlisted under the banner of the cross; and none but the marquis Boniface and Simon of Montfort, who were absent, escaped these spiritual thunders. The crusaders formed an alliance with young Alexius, the Greek prince; who promised in his own and his father's name, that as soon as they should be seated on the throne of Constantinople, they would terminate the long schism of the Greeks, submit to the lawful supremacy of the Roman church, pay the crusaders, for their services, 200,000 marks of silver, and accompany through Egypt, or maintain during a year 10,000 men, and during his life, 500 knights, for the service of the Holy Land. The alliance was ratified by mutual oaths and seals. They then proceeded towards Constantinople with all possible speed, which they besieged and captured. Thus was this crusade diverted from Syria to Constantinople, and the conquest of the Greek or Roman empire by the Latins.

The *sixth* crusade was undertaken A.D. 1217, under the pontificate of Honorius III. by the confederate army of Italy and Germany. The allied army was commanded by Andrew, king of Hungary, who was joined by Leopold, duke of Austria, Lewis of Bavaria, and several other princes. In this crusade 200,000 Franks were landed at the eastern mouth of the Nile, and it was expected that Palestine might be subdued in Egypt, the seat and storehouse of the sultan. After a few months absence Andrew returned into Europe. The remaining chiefs carried on the war with vigour, and in the year 1220 made themselves masters of Damietta, the strongest city in Egypt; but their prosperity was of short duration; for in the following year their fleet was totally ruined by that of the Saracens, their provisions cut off, and their army reduced by sickness and other causes to the greatest distress. This irreparable loss was followed by that of Damietta, and their expectations were completely frustrated. By the evacuation of Damietta they obtained a safe retreat, some concessions for the pilgrims, and the tardy restitution of the doubtful relic of the true cross. The failure has been ascribed, in some measure, to the abuse and multiplication of the crusades, which were preached at the same time against the Pagans of Livonia, the Moors of Spain, the Albigeois of France, and the kings of Sicily of the imperial family.

A *seventh* crusade was undertaken by the emperor Frederick II., who set out A.D. 1228, after having been excommunicated for his delay by the incensed pontiff Gregory IX. As soon as he landed in Palestine, he turned all his thoughts towards peace, and without consulting the other princes and chiefs of the crusade, concluded, A.D. 1229, a treaty of peace, or rather a truce of 10 years, with Melic-Camel, sultan of Egypt. He stipulated, among other things, that he should be put in possession of the city and kingdom of Jerusalem; which condition was immediately executed, and the emperor, entering into the city with great pomp, placed the crown upon his head with his own hands; and he then returned without delay into Italy, to appease the discords and commotions which the vindictive and ambitious pontiff had excited in his absence. The expeditions that followed were less important and less successful.

ful. In 1239 Theobald VI., count of Champagne and king of Navarre, set out from Marseilles for the Holy Land, accompanied by several French and German princes; and in the following year another expedition was undertaken by Richard, earl of Cornwall, brother to Henry III., king of England. The former of these expeditions failed through the influence of the emperor's ambassadors in Palestine, who renewed the truce with the Mahometans; while, on the other hand, a considerable body of Christians was defeated at Gaza, and such as escaped the carnage returned to Europe. This fatal event was chiefly owing to the discords that subsisted between the Templars and the knights of St. John of Jerusalem. Hence it happened, that the arrival of Richard, indulgently retarded by Gregory IX., and which had somewhat revived the hopes of the vanquished, was ineffectual to repair their loss. The utmost which he could accomplish was to conclude a truce with the sultan of Egypt, in the year 1241, after which he immediately set sail for Europe.

The *eighth* crusade was undertaken by Louis IX. king of France, in consequence of a vow which he had made in the year 1248, on occasion of a very dangerous illness: his first attempts, after he had arrived in Egypt with a formidable army and a numerous fleet, were crowned with success; for Damietta yielded to his arms; but the progress of the war presented one uniform scene of calamity and desolation. Famine and pestilence overwhelmed the royal army in 1250; Robert, earl of Artois, the king's brother, was slain in an engagement with the Saracen army; and, a few days after, the king himself, with two other brothers, and the greatest part of his army, were taken prisoners in a bloody action after a bold and obstinate resistance. The ransom of this prince, together with the restoration of Damietta, cost a sum, which in our days would amount to about 190,000 pounds sterling. After having remained four years in Palestine, he returned to France in 1254, with the small remnant of his formidable army.

The *ninth*, and last, crusade was renewed by the same valiant, but unfortunate monarch; who, with a formidable fleet and a splendid train of princes and nobles, arrived upon the African coast, and made himself master of the fort of Carthage. But a pestilential disease broke out in the fleet, in the harbour of Tunis, carried off the greatest part of his army, and seized at last the sovereign himself, who fell a victim to its rage on the 25th of August, A.D. 1270. Louis was the last of the European princes that embarked in the holy war; the dangers and difficulties, the calamities and disasters, and the enormous expences that accompanied each crusade, dispirited the most zealous, and discouraged the most intrepid promoters of these fanatical expeditions.

Towards the beginning of the 14th century, several attempts were made by the monarchs and princes of the west, incited by the Roman pontiffs, to renew the war in Palestine against the Turks and Saracens. But their success was not answerable to their zeal. Clement V. urged this business with the greatest ardour in the years 1307, 1308, and appropriated an immense sum of money for carrying it on with alacrity and vigour. John XXII. ordered a fleet of 10 ships to be fitted out in the year 1319 to transport an army of adventurers into Palestine, and had recourse to the influence of indulgences for raising the funds necessary to the support of this great enterprise. But it was a ground of complaints against their pontiff, that he made use of the holy war as a pretext to disguise his avarice and ambition. Under the pontificate of Benedict XII., a formidable army was raised in the year 1330, by Philip de Valois, king of France, with a view of attempting the deliverance of Chris-

tians in Palestine; but when he was ready to embark his troops, the apprehension of an invasion from England obliged him to lay aside the enterprise. In the year 1335, Clement V., at the request of the Venetians, engaged, by the persuasive power of indulgences, a prodigious number of adventurers to embark for Smyrna; but the want of provisions obliged them soon to return. Another formidable army was raised, A.D. 1363, in consequence of the zealous exhortations of Urban V., and it was to be employed, under John, king of France, in an expedition against the infidels; but the unexpected death of that prince disappointed the expectations formed from this grand project, and occasioned the dispersion of the numerous body which had repaired to his standard.

Although the crusades, which wasted the population of Europe, and squandered away immense sums of money, will ever remain in the records of history, as a singular monument of human folly; yet from these expeditions, extravagant as they were, beneficial consequences followed, which had neither been foreseen nor expected. In their progress towards the Holy Land, the crusaders marched through countries better cultivated and more civilized than their own. Constantinople, in particular, was the greatest, as well as the most beautiful, city in Europe, and the only one in which there remained any image of the ancient elegance in manners and arts. The naval power of the eastern empire was considerable. Manufactures of the most curious fabric were carried on in its dominions. Constantinople was the only mart in Europe for the commodities of the East Indies. Great wealth flowed into the capital from these various sources; which not only cherished such a taste for magnificence, but kept alive such a relish for the sciences as appear considerable when compared with what was known in other parts of Europe. Even in Asia, the European crusaders found the remains of the knowledge and arts, which the example and encouragement of the caliphs had diffused throughout their empire. It was not possible for the crusaders to travel through so many countries, and to behold their various customs and institutions, without acquiring information and improvement. Their views gradually enlarged; their prejudices subsided; new ideas crowded into their minds; and they must be sensible, on many occasions, of the rudicity of their own manners compared with those of a more polished people. These impressions would remain when they returned to their own countries. A close intercourse subsisted between the east and west for two centuries; new armies were continually marching from Europe to Asia, while former adventurers returned home and imported many customs to which they had been familiarized by a long residence abroad. Accordingly we discover, soon after the commencement of the crusades, greater splendour in the courts of princes, greater pomp in public ceremonies, a more refined taste in pleasure and amusements, together with a more romantic spirit of enterprise spreading gradually over Europe; and to these wild expeditions, the effect of superstition and folly, we owe the first gleams of light which tended to dispel barbarity and ignorance. These effects, however, would be slowly produced; but the influence of the crusades upon the state of property, and consequently of power, in the different kingdoms of Europe, was more immediate and more discernible. The nobles, who assumed the cross, found it necessary to raise large sums for these expeditions; but the genius of the feudal system did not admit of the imposition of extraordinary taxes; and therefore large sums could be raised only by the sale of their possessions. The ardour of their zeal disposed them to alienate their ancient inheritances at a low price; and thus the monarchs

varchs of different kingdoms, nine of whom engaged in the first crusade, seized this opportunity of annexing considerable territories to their crowns at a small expence. The fiefs likewise of those great barons who perished in the holy war and left no heirs, reverted to their respective sovereigns; and by this accession of property and power, the regal authority increased in proportion as the aristocracy declined. The prerogative of sovereigns was also extended in consequence of the departure of those powerful vassals, who were accustomed to limit and controul it; and thus they acquired a degree of weight in the constitution which they had not formerly possessed. Those who followed the cross were taken under the special protection of the church, and it denounced its anathemas against such as should disgust and wrong them; hence hostilities would be for a time suspended, and extinguished; and a more general and steady administration of justice would be introduced, and some advances would be made towards the establishment of a more regular government in the several kingdoms of Europe. The commercial effects of the crusades were not less considerable than those that have been already recited. Venice, Genoa, and Pisa furnished the transports in which the crusaders embarked; and these cities received immense sums for freight on account of numerous armies. The crusaders also contracted with them for provisions and military stores; and whilst the fleets kept on their coasts as the armies advanced by land, these states engrossed all the profits of that lucrative branch of commerce. Besides, they obtained grants of the most extensive immunities in the several settlements which the Christians made in Asia. When the crusaders seized Constantinople, and placed one of their leaders on the imperial throne, the Italian states were considerable gainers by that event. Many valuable branches of the commerce, which formerly centered in that city, were transferred to Venice, Genoa, or Pisa. The wealth which thus flowed into these cities served to establish and to maintain their liberty and independence. By the increase of wealth, which was owing to the commerce resulting from the crusades, a spirit of activity and a passion for liberty and independence were excited; so that before the conclusion of the last crusade all the considerable cities of Italy had either purchased or had extorted large immunities from the emperors. See *CITY and CHARTERS of Community*.

In tracing the consequences and effects of the crusades, Mr. Gibbon states, that the intercourse between Constantinople and Italy diffused the knowledge of the Latin tongue; and several of the fathers and classics were at length honoured with a Greek version. If we compare, he says, at the era of the crusades, the Latins of Europe with the Greeks and Arabians, their respective degrees of knowledge, industry, and art, our rude ancestors must be content with the third rank in the scale of nations. Their successive improvement and present superiority may be ascribed to a peculiar energy of character, to an active and imitative spirit, unknown to their more polished rivals, who, at that time, were in a stationary or retrograde state. With such a disposition, the Latins might have derived essential benefits from events which opened to them a long and frequent intercourse with the more cultivated regions of the East. Their first and most obvious progress was in trade and manufactures, in the arts, which are strongly prompted by the thirst of wealth, the calls of necessity, and the gratification of the sense or of vanity. But the intellectual wants of the Latins were more slowly felt and supplied; and in the age of the crusades, they viewed with careless indifference the literature of the Greeks and Arabians; nor did they derive any substantial advantage from it. The principle of the crusades was a savage fanati-

cism; and the most important effects were analogous to the cause. Each pilgrim was ambitious to return with his sacred spoils, the relics of Greece and Palestine; and each relic was preceded and followed by a train of miracles and visions. The active spirit of the Latins preyed on the vitals of their reason and religion; and if the 9th and 10th centuries were the times of darkness, the 13th and 14th were the ages of absurdity and folly. The embers of the arts of antiquity, as Mr. Gibbon conceives, were rekindled by the northern conquerors of the Roman empire; and after a long interval, from the reign of Charlemagne forward, the tide of civilization began to flow, about the 11th century, with a steady and accelerated course. During the two centuries of the crusades, its increase was great, and its progress rapid; and some philosophers, as we have already stated, have applauded the propitious influence of these holy wars; but Mr. Gibbon thinks, that they checked rather than forwarded the maturity of Europe. The lives and labours of millions, which were buried in the East, would have been more profitably employed in the improvement of their native country; the accumulated stock of industry and wealth would have overflowed in navigation and trade; and the Latins would have been enriched and enlightened by a free and friendly correspondence with the climates of the East. In one respect Mr. Gibbon perceives the accidental operation of the crusades, not so much in producing a benefit as in removing an evil. "The larger portion of the inhabitants of Europe was chained to the soil, without freedom, or property, or knowledge; and the two orders of ecclesiastics and nobles, whose numbers were comparatively small, alone deserved the name of citizens and men. This oppressive system was supported by the acts of the clergy and the swords of the barons. The authority of the priests operated, in the darker ages, as a salutary antidote:—they prevented the total extinction of letters, mitigated the fierceness of the times, sheltered the poor and defenceless, and preserved or revived the peace and order of civil society. But the independence, rapine, and discord, of the feudal lords were unmingled with any semblance of good; and every hope of industry and improvement was crushed by the iron weight of the martial aristocracy. Among the causes that undermined that Gothic edifice, a conspicuous place must be allowed to the crusades. The estates of the barons were dissipated, and their race was often extinguished, in these costly and perilous expeditions. Their poverty extorted from their pride these charters of freedom which unlocked the fetters of the slave, secured the farm of the peasant, and the shop of the artificer, and gradually restored a substance and a soul to the most numerous and useful part of the community. The conflagration which destroyed the tall and barren trees of the forest gave air and scope to the vegetation of the smaller and nutritive plants of the soil." Gibbon's *Hist. Rom. Emp.* vol. ii. Robertson's *Hist.* ch. v. vol. i. *Hist. Diss.* concerning India, p. 131, &c. Smith's *Wealth of Nations*, vol. i. ch. 3. Mosheim's *Eccle. Hist.* vol. ii. and iii. Hume's *Hist.* vol. i. and ii.

Towards the middle of the 12th century, A. D. 1143. there was also a crusade of the Saxons, against the pagans of the north, whom they determined either to convert or to extirpate. The attempt produced the usual effects, ravages and murders, and then was dropped. In this crusade the archbishop of Magdeburg, the bishops of Halberstadt, Munster, Meriburgh, Brandenburg, &c. with several lay-lords, embarked. And towards the beginning of the same century, under the pontificate of Innocent, there was also a crusade undertaken against the Albigenses; who were become powerful in Languedoc, &c. and who had no other

crime but that of rejecting the tyranny, idolatry, and superstitions of the church of Rome. See ALBIGENSES.

When the opinions of Wickliffe were disseminated in Bohemia, as well as in England, the court of Rome was much alarmed; and pope Martin V. published a bull, A. D. 1428, which he sent into England, as well as into other countries, commanding solemn processions to be made, on the first Sunday of every month, in all churches and churchyards, in order to draw down the vengeance of heaven on the heretical Bohemians; and promising 60 days' indulgence to all who attended these processions, or who said 25 paternosters, with the same pious intention. His holiness, not trusting entirely to supernatural interposition for the destruction of the enemies of the church, proclaimed a crusade against the Bohemians, granting the pardon of all their sins, and the happiness of heaven, to all who contributed to its success, in proportion to the value of the contribution. Many of the English engaged in this crusade, which was conducted by the cardinal of Winchester.

The capture of Constantinople, May 29, A. D. 1453, by Mahomet II., emperor of the Turks, alarmed all the Christian princes and states of Europe. But these princes and states were so much engaged in war, that they could not unite against the common enemy, but left it to the clergy to wield their spiritual weapons against those adversaries of the Christian faith. Archbishop Kemp published in England March 2, A. D. 1453, an order for processions to be made for a whole year, and he was followed in this course by his successor; processions being then regarded as the most effectual means of obtaining the divine favour and assistance. At length pope Pius II. (Æneas Silvius), published a long, eloquent, and pathetic bull, A. D. 1463, engaging to march in person, at the head of a Christian army, against the Turks, and most earnestly exhorting all Christians to take the cross, or to contribute by their money to the success of the expedition; promising the pardon of sin, and the happiness of heaven to all who complied with his desire: at the same time the pope sent bulls into every Christian country, imposing a tax of one-tenth on the benefices of all the clergy. Edward IV., then king of England, not willing to acknowledge the pope's right to tax his clergy, and yet desirous that they should, on this occasion, contribute liberally, wrote to the primate to raise a handsome sum by voluntary assessment, which would satisfy the pope, and prevent the publication of his bull. This plan was adopted; but it was with great difficulty that the primate could prevail on the clergy to grant six-pence in the pound.

CROISE, LAKE *of, Isle a la Croise.* See CROSSE.

CROISES, or CROIZES, in our *Ancient Customs*, pilgrims bound for the Holy Land, or who had already been there; so called from a badge which they wore on their garments, representing a cross. See CROISADE.

The word croises is also extended to the knights of St. John of Jerusalem, created for the defence and protection of pilgrims; and all those of the nobility, gentry, &c. who, in the reigns of king Henry II., Richard I., Henry III., and Edw. I. were *cruce signati*, i. e. dedicated themselves to the wars for the recovery of the Holy Land.

CROISIE, Lt, in *Geography*, a small town of France, in the department of the Lower Loire; 9 miles N. of the mouth of the Loire, with a good harbour, and 306 miles S.W. of Paris. E. long. 15° 8' 18", and N. lat. 47° 17' 40", according to the French computation. It is the chief place of a canton, in the district of Savenay, and one of the 84 maritime quarters into which all the principal sea-port towns of France are divided, with a judge of admiralty, to whom the maritime syndics of St. Nazaire, Montoir, Mes-

quer, and Redon are subordinate, and who, in his turn, is subordinate to the admiralty court of L'Orient. Le Croisic contains 2310, and the canton itself 5564 inhabitants in two communes, and on a territorial extent of 52½ kilometres.

CROISIERS, CRUCIGERI, or *Cross-Bearers*, a religious order, or congregation of regular canons, so called.

There are three orders which have, or do still bear this name; one in Italy; another in the Low Countries, and a third in Bohemia.

The first pretend to be derived from St. Clet; and add, that St. Quiriacus the Jew, who slew S. Helena the place of the true cross, and was afterwards converted, reformed them. All we know for certain is, that they subsisted in Italy before Alexander III. mounted the throne; for that pontiff, flying from Frederic Barbarossa, found an asylum in the monasteries of the croisiers, which he afterwards, in 1169, took under his protection, giving them the rule of St. Augustine, &c.

They were confirmed by Pius V.; but the discipline being much relaxed, they were suppressed, in 1656, by Alexander VII.

Matt. Paris says, that the croisiers, bearing staves with crosses at the end, came into England in 1244, and presented themselves before a synod held by the bishop of Rochester, demanding to be admitted. They were here called *crouched friars*.

Dodsworth and Dugdale mention two monasteries of this order in England, the one at London, the other at Ryegate; the first founded in 1245, the latter in 1298; some add a third at Oxford, where they were received in 1349. M. Allemand says, there were fourteen monasteries of cross-bearers in England; adding, that they came from Italy; those of the Low Countries disowning them.

The croisiers of the Low Countries and France were founded in 1211, by Theodore de Celles, son of Bofon, who, having served in a crusade in Palestine, in 1188, and there found some of the croisiers instituted by St. Clet, conceived a design of instituting another congregation in his own country. This is certain, that Theodore, in his return from Palestine, engaged himself in the ecclesiastical state; and went in quality of missionary to the crusade against the Albigenes: and that at his return, in 1211, the bishop of Liege gave him the church of St. Thibault near Huy; where, with four companions, he laid the foundation of his order; which was confirmed by Innocent III. and Honorius III. Theodore sent his religious to Tholouse, to join those of St. Dominic, and combat the Albigenes; and the congregation multiplied in France. The popes have endeavoured to bring the croisiers of Italy under those of Flanders. The croisiers, or port croix with a star, in Bohemia, derive their origin from St. Quiriacus, and say they came from Palestine into Europe, where they embraced the rule of St. Augustine, and built monasteries. They add, that St. Agnes of Bohemia, to distinguish them from other croisiers, obtained of Innocent IV. to add a star to their habit. But the story of St. Quiriacus has no foundation; and it was Agnes herself, daughter of Premislaus, king of Bohemia, who instituted the order at Prague, in 1234. They are very numerous, and have now two generals.

CROISILLES, in *Geography*, a small town of France, in the department of Pas-de-Calais, chief place of a canton, in the district of Arras, with a population of 972 individuals. The canton has 28 communes, and 14,487 inhabitants, upon a territorial extent of 185 kilometres.

CROISSANT CONTOURNE', in *Heraldry*, denotes the half moon, looking to the left side of the shield.

CROISSANTE',

CROISSANTE, **CROIX**, is a cross crescented; that is, having a crescent, or half-moon, fixed on each end thereof.

CROISSILLE, in *Geography*, a town of Savoy, in the duchy of Geneva; 11 miles N.N.W. of Annecy.

CROISSY, a small town of France, in the department of Seine and Marne; 15 miles E. of Paris, and 3 miles from the left shore of the Marne. Before the French revolution of 1789, it conferred the title of marquis on the lords of the manor.

CROITES ROMOS, in *Ancient Geography*, the name given to the territory of the town of *Cros*, situated in Egypt. Steph. Byz.

CROIUS, **JOHN**, in *Biography*, a French Protestant minister, who flourished in the 17th century, was born at Uzeze, where he officiated as a minister. He was a considerable writer on controversial subjects; but his principal work was in Latin, intitled, "Observationes sacræ et historicæ in Novum Testamentum," 1644. In early life he was reckoned a high Calvinist, but afterwards embraced the sentiments of the Universalists. He died in the year 1659.

CROIX-DU-MAINE, **FRANCIS GRUDÉ DE LA**, a writer frequently referred to by the French literati, was born in the province of Maine in 1552. He was educated at Paris, and discovered, at an early age, a great passion for collecting books. In 1584, he published a general catalogue of all French writers, intitled, "Bibliothèque Française." He was author also of a plan of a complete library, addressed to Henry III. He was assassinated at Tours in 1592. A new edition of his Bibliothèque was published with that of Verdier, in 5 vols. 4to. 1772, 1773.

CROIX, DE LA, **G.** a French landscape-painter of some eminence, the scholar of Vernet, whose style he adopted. Several prints have been engraved from the pictures of this master. We shall only mention the following: "Le Tybre, paysage & les orientaux au bord du Tybre," 2 large pieces, lengthways, engraved by Aliamet. "La Cascade de Tivoli," by de Flumet. "Vue de Mont Vefuve," as it appeared in 1757, lengthways, 1762, by Le Miré. Heineken.

CROIX, DE LA, **P. F.** a portrait painter, a native of Holland, from whose pictures we have the following plates: "William V. Prince of Orange, and the Princess Caroline of Orange," two standing figures, a pair, engraved by Tanjé, 1755. "Portraits of the fame," a pair, by Houbraken. "Wolf Dietrich, Count of Beuchling," by Bodenehr. "J. Van Span," by J. Houbraken. "Eg. Buys," by the same. "Sebast. le Clerc, the Engraver," by Dupin. Heineken.

CROIX, La, en Bric, in *Geography*, a small town of France, in the department of Seine and Marne; 6 miles W. of Provins, formerly a commandery of the order of Malta.—Also, a small town of France, in the department of Eure; 6 miles N.E. of Evreux, properly called *La Croix Saint Leufroy*.

CROIX, La, a mountain of Piedmont, in the district of the Four Vallies; 13 miles W. of Pignerol.

CROIX, Cape, a cape on the W. coast of Africa, in the Mediterranean. N. lat. 3° 38'. W. long. 9° 55'.

CROIX, Sainte, Santa Cruz, one of the three Caribbee islands of the Virgin Group which the Danes possessed in the West Indies, until the latter end of December, 1807, when the three Danish islands surrendered by capitulation to the English. Denmark had purchased St. Croix from France in 1733. It is situated about five leagues east of St. Thomas, in the 64th degree of western longitude, and the 18th of north latitude, ten or twelve leagues long, three or four broad, and intersected by several small rivers. The air is

rather unhealthy at certain times of the year, the whole island being almost level. The soil is uncommonly fertile.

St. Croix has many valuable sugar and cotton plantations. It used to export annually from 20 to 24,000 hogheads of sugar, from 7 to 8000 puncheons of rum, and 150 cwt. of cotton. Christianstadt was the residence of the Danish governor. The population of this town exceeds 5000 individuals, and it has a good harbour.

In 1796 this island had a population of 2223 white, 1164 free negroes, and 25,425 negro slaves; but the importation of slaves into the Danish islands has ceased since 1803. There were in St. Croix 160 sugar plantations, each of which gave 150 hogheads of 100wt.

The other two Danish West India islands, which are likewise in possession of the English at present (1808), are St. Thomas and St. John. The three islands had been taken by the English in 1801, during the short war between Great Britain and Denmark, on account of the revived convention of armed neutrality; but they had been restored after the memorable battle of Copenhagen of the 27th of April, 1801. (Oxholm's Danish Account of the Danish West India Islands.)—Also, a small town of France, in the department of the Upper Rhine, 12 miles north of Ensisheim, in the district of Colmar.

CROIX, St., or *Santa Cruz*, a town of Luconia, one of the Philippine islands, which is separated from Manilla by a river that flows under the walls of this city, and serves as a harbour for merchant ships. St. Croix is in part equally well built with the capital; peopled with Indians and Spaniards in considerable numbers, and surrounded by three villages of the natives, which may be regarded as suburbs.

CROIX, St. a small navigable river in Nova Scotia, which runs into the Avon or Pigiguit.—Also, a river which forms part of the boundary-line between the United States of America, and the British province of New Brunswick, and discharges itself into Passamaquoddy bay.—Also, a river in the north-west territory, which runs into the Mississippi from the N.N.E. about 50 miles below the falls of St. Anthony.

CROLIES, a small town of France, in the department of the Isere, 12 miles N.E. of Grenoble.

CROMA, Ital. in *Music*, the character which in English is called a quaver. It is the eighth part of a semibreve; has a black head, like a crotchet, and a hook at the

tail: thus, when single, ; but when united with other

quavers, it has a single tie; thus, . See **CROTCHET**, and **TIME-TABLE**.

CROMACH CRAIG, in *Geography*, a mountain of Scotland, in the county of Perth; 5 miles N. of Crieff.

CROMACK HEAD, a cape of Scotland, on the N. coast of the county of Bamff; 3 miles N.W. of Cullen.

CROMARTY HARBOUR, in Cromartyshire, in Scotland, is a spacious and safe retreat for ships, at the entrance of Murray Firth, about 18 miles to the eastward of the commencement of the Inverness and Fort William, or Caledonian canal; see **CANAL**. This harbour was surveyed in 1801 by Mr. Thomas Telford, with a view to some improvements therein for the better accommodation of ships, intending to pass or having passed the Caledonian canal, connecting the east and west British seas.

CROMARY, a town of France, in the department of the Saône, and district of Vezoul; 2½ leagues N. of Besançon.

CROMATIC French Horns, in *Music*, were instruments manufactured

manufactured by Charles Clagget, of Greek-street, Soho, which, we are told, were capable of producing the full chromatic scale of the organ, without the aid of crooks, or the instrument undergoing any part of change. On the 15th of April 1791, a trial of two of these instruments was made in a concert in the New Rooms at Bath, in the presence of a full company, when the performers are said to have performed their parts in several airs of Haydn's, Giardini's, &c. and to have modulated as far as seven flats, in perfect harmony with the violins, violincellos, &c. every intonation being pointed, clear, quick, and in the natural tone of the instrument.

CROMAU, CRMAU, or KRUMLOW, in Latin *Cromena*, in *Geography*, a small but well built town of Bohemia, in the circle of Bechin, or Bechynsko, on the river Mulda. It has a good citadel, and a college of Jesuits, and confers the title of dukes on the princes of Schwartzenberg, to whom it belongs. There are some silver mines in its neighbourhood.

CROMBACH, a town of Germany, 7 miles N.E. of Siegen.

CROME, or CROOM, in *Agriculture*, a name provincially applied to an implement of the fork kind, with crooked or hooked prongs. Thus we have muck croome, turnip crooms, &c.

CROMER, GIULIO, called *IL ROMA*, in *Biography*, a painter of some reputation in his time, who was born in Ferrara, about the year 1572. He was the scholar of Domenico Mona, but his style more resembles that of Jacopo Bambini, another Ferrarese painter of that period. The pictures of this artist evince much study, and considerable correctness of design; but they are characterised by the reddish tint which pervades his carnations, and a too ostentatious introduction of architectural decoration. In the church of S. Andrea in Ferrara are several large compositions by this master, representing the actions of that saint, besides some small altar-pictures. Cromer died in 1632.

CROMER, in *Geography*, a town of England, situated on the N.E. coast of the county of Norfolk, having a harbour for fishing vessels, and chiefly inhabited by fishermen. Attempts have been made for erecting a pier, but hitherto without success, the sea washing it away. This town appears to have been formerly much larger than it is now: as it had two churches, one of which has been demolished by the inundation of the sea. It is now a place of resort for sea-bathing; and has a weekly market on Saturday; 23 miles N. of Norwich, and 127 N.N.E. of London. N. lat. 52° 55'. E. long. 0° 50'.

This place has no harbour for ships, but vessels of 60 to 100 tons burthen are laid upon the sandy beach, where carts can be drawn to them when the tide retires, and thus, coals, tiles, oil-cakes, and other commodities are imported for the use of the inhabitants, and some corn is exported. A lighthouse stands about three-quarters of a mile eastward of the town, lighted by 15 argand lamps, each with a large plated copper reflector behind it, arranged round an upright axis, which, by means of a large clock-movement, is made to revolve once in a minute, constantly presenting to the mariner off the coast, a series of moving lights, so different from any other, as to be immediately distinguished in the night.

CROMFORD CANAL. This is the parliamentary name of a navigable canal in the counties of Nottingham and Derby, of about 18 miles in length, cut about 15 years ago, for carrying coals, corn, &c. up into the mining district of Derbyshire, and bringing down lead, mill-stones, grind-stone, lime-stone, marble, &c. for exportation, by means of the Erewash and Nottingham canals with which

it connects; see our article **CANAL**, wherein we omitted to mention a short collateral cut to Lea bridge stone-sawing mill and wharf; it is near half a mile in length from the Derwent aqueduct bridge, and is level with the line, except in time of floods, when a lock is used for turning the same over the weir at its top, into Lea brook. Messrs. Dadford, Shaveby, Benjamin Outram, and Edward Fletcher, were employed as engineers with Mr. Jessop, on different parts of the works of this canal.

CROMFORD, a town in the parish of Wirksworth, Derbyshire; within 35 years past this place has increased in population, so as to have become a considerable town: the *Cromford Canal* terminates at this town (which see). Cromford fough, a subterraneous drain or passage of near two miles in length cut in the solid lime-stone rock, for freeing the lead mines near Winstar of water, at an expence exceeding 30,000 *l.*, gave rise to the subsequent prosperity of this place, by furnishing an opportunity to Mr., afterwards sir, Richard Arkwright, to erect his first cotton spinning mill, to which another similar establishment has since been added. The late sir Richard Arkwright erected a spacious and convenient chapel of ease for this town, of the salmon-coloured grit stone, which is dug on the S. E. side of the town, above the lime-stone Shale stratum. The same patriotic individual contributed much to the ornament of the environs of this town, by his plantations and other improvements. Stocking-weaving and lace-weaving are carried on to some extent in this town, whose inhabitants, the girls in particular, are much subject to a disease called the thick neck, from a tumour which forms in that part, which is said by some to be hereditary.

CROMIS, in *Ichthyology*, the *coracinus brasiliensis* of Ray, the *guaticupa* of Marcgrave, and the *LABRUS cromis* of Gmelin; which see.

CROM-LECHE, in *British Antiquity*, derived, according to the conjecture of Mr. Rowlands, from the Hebrew *carem-luach*, a devoted stone or altar, are huge, broad, flat stones, raised upon other stones set up on end for that purpose. They are common in Angleley; and Mr. Rowlands (*Mona Antiqua Restaurata*), supposes, that they are the remains of altars erected there by the first colonists.

Mr. Gough, in his "*Sepulchral Monuments of Great Britain*," supposes, that these cromleche were Danish monuments. Mr. King, in his "*Monumenta Antiqua*," vol. i. inclines to think, that they were altars for idolatrous sacrifices. Mr. Toland also, in his "*History of the Druids*," mentions, that the cromleche were altars of a larger size than those denominated "carns," or "cairns," and consisting of a greater number of stones; some of them serving to support the others, on account of their enormous bulk. They were placed in the centre of the circular temples of the Druids, and near them has been found, occasionally, a prodigious stone, which served as a pedestal to some deity. He says, that they were places of worship, and so called from *bowing*, the word being derived from *crom* or *crum*, which, in Armoric, Irish, or Welsh, signifies "bent," and *lech*, or *leac*, "a broad stone," and signifying the "bowing-stone." Mr. Toland mentions a cromlech in Nevers parish in Pembrokeshire, South Wales, having the middle stone 18 feet high, and 9 broad towards the base, but narrowing upwards: and by it there lay a broken piece 10 feet in length, which seemed to be of a weight heavier than 20 oxen could draw. But at Poitiers in France, there is one supported by 5 lesser stones, much exceeding all in the British islands, as it is 50 feet in circumference. This he conceives to have been a "Rocking-stone." At Bodouyr, in Anglesea, there is a noble cromlech; many of them are 30 ton in weight; but they differ in size, as all pillars

pillars do; and the altars are always larger than the "Kistieu-vaen." In some parts of Wales these stones are called "Meincuguyr," importing the same with "cromleche." In Caithness, and other remote parts of Scotland, these cromlechs are very numerous, some of them pretty entire, and others, not so much consumed by time and overturned by storms, as disordered and demolished by the hands of men. But no such altars were ever found by Olaus Wormius, the great northern antiquary, nor by any others, in the temples of the Gothic nations, or of those who speak the several dialects of Gothic original, from Ireland to Swiflerland, and from the Bril in Holland, to Presburg in Hungary, the Bohemians and Polanders excepted. Among the Germans there were no Druids, and they had no sacrifices; and therefore to the former altars were as useless as they were necessary to the latter. In Jersey likewise, as well as in the other neighbouring islands, there are many altars and cromlechs. The principal cromlech in Ireland was "Crum-cruch," which stood in the midst of a circle of 12 obelisks, on a hill in Bresin, a district of the county of Cavan, formerly belonging to Leitrim. It was wholly covered with gold and silver; the lesser figures on the 12 stones about it being only of brass; which metals, both of the stones and statues they bore, became every where the prey of the Christian priests, upon the conversion of that kingdom. The druidical altars of a smaller size were called "carns," or "cairns." These cairns consisted of stones of all sorts, from one pound to a hundred: they are round in form, and somewhat tapering or decreasing in size upwards; but on the summit was always a flat stone: some of them contain at least 100 cart-loads of stone: and if any of them be grown over with earth, it is by accident, in the long course of time during which they have been neglected; for this was not intended when they were first constructed, as was the case with regard to the sepulchral barrows of the Gothic nations, which are generally of earth. Such a place is in the ancient Celtic language, and in every dialect of it, called "Carn," and every carn was so disposed as to be within view of some other. On the carn, called "Crig-y-dyon," in the parish of Trelech, in Carmarthenshire, the flat stone on the top is 3 yards in length, 5 feet over, and from 10 to 12 inches thick. The circumference of this carn at the base is about 60 yards, and its height about 6 yards; the ascent being very easy: though perhaps a ladder was originally used for this purpose. In process of time, the cairns served every where for beacons; though they were originally designed for fires of another nature. See BELENUS and BEL-TEIN.

Of the altars called cairns, many are to be seen entire in Wales, particularly two in a parish of Denbighshire, hence called "Kerig-y-Druidion," or Druid's stones, and one in Llan-Hammwlch parish, in Brecknockshire. These Druids' altars were commonly placed in the middle of the temples, near the great stone or colossus, which we have already mentioned; such as that at Carn Llechart, in the parish of Llan-gvvelach, near Swansea, in Glamorganshire, and others in Scotland. These are called by the Welsh, in the singular number, "Kist-vaen," that is, a stone-chest; and in the plural, "Kistieu-vaen," stone-chests. But they denote things quite different from those real stone-chests or coffins, commonly of one block and the lid, that are in many places found under ground. Wherever a circle occurs without an altar, it is certain that there was one formerly; as altars are found where the circular obelisks are mostly or all taken away for other uses, or from an aversion to this superstition, or because time has destroyed them. Those who adopt the opinion, now commonly received, from the bones which are

often found near these altars or circles, though seldom within them, that they were burying-places, forget what Cæsar, Pliny, Tacitus, and other authors affirm, concerning the human sacrifices offered by the Druids; and in mistaking the ashes found in these cairns, they betray an ignorance of those anniversary fires and sacrifices for which they were reared. The huge coping-stones of these cairns were to serve as altars, and altars of the lesser form are frequently found near them; as in the large Latin and Greek churches, there are, besides the high altar, several smaller ones.

CROMMYON, or CROMYN ACRIIS, in *Ancient Geography*, a promontory of the isle of Cyprus, at the extremity of the peninsula, towards the north, between Soloë to the south-west, and Lapathus to the south-east. It is now Cape Cormachitti.—Also, a village of Greece, in the territory of Corinth.

CROMMYONESUS, the name given by Pliny to a small island of Asia Minor, which he places in the vicinity of Smyrna.

CROMNA, a town situated on the coast of Paphlagonia, near the river Parthenius. Steph. Byz. supposes this place to have been the ancient Amaltris; but Arrian states that they were at the distance of 120 stadia from one another. The destruction of Cromna, however, contributed to the aggrandizement of Amaltris.

CROMNUM, a town of Greece, in the Peloponnesus, situated near Megalopolis.

CROMONT, in *Geography*, a small town of France, in the department of the Somme, 9 miles E. of Abbeville.

CROMORNE, *Fr.* in *Musie*, a reed-stop in most of our old organs, built by Father Smith, and other Germans. And we believe that the word is of German origin: as KRUMON is crooked, and the name of this stop should be written KRUMHORN. Whether it was at first intended that the tone of this stop should imitate a cornet, a shawn, or a bassoon, is not settled. Menage, in his *Dct. Etym.* thinks the latter; and the tone certainly resembles a bassoon more than any other instrument.

CROMPTON POINT, in *Geography*, the N.E. point of the island of Dominica. N. lat. 15° 42'. W. long. 61° 21'.

CROMWELL, THOMAS, earl of Essex, in *Biography*, was the son of a blacksmith at Putney, in Surrey, but who became invested with great authority, and at length was sacrificed by the prince whom he had long and faithfully served. In what manner Thomas Cromwell was educated, and for what profession he was particularly intended does not appear, but we find him early in life situated as clerk to the English factory at Antwerp. In the year 1510 he visited Rome; and it has been thought he served as a soldier in the duke of Bourbon's army, and that he was present when that city was plundered. See ROME. As, however, this happened in the year 1527, and it is known that Cromwell was actively employed in England sooner than this period; the conjecture is probably without foundation. He was patronised by cardinal Wolsey, and assisted him in founding the two colleges at Oxford and Ipswich, and in procuring, in 1525, the suppression of some monasteries for their endowment. When the cardinal was disgraced, Cromwell used his utmost efforts to restore him to his sovereign's favour; and by his exertions in the house of commons, of which he was a member, he prevented the passing of the articles of treason exhibited there against him. For his intrepidity on this occasion, he obtained the king's favour, and was taken into his service, in which he engaged with more zeal than honesty. He suggested to Henry a project for raising a supply of money of his clergy, who through fear gave up, as a gift, about 120,000*l.* For this and other services he obtained

obtained the honour of knighthood, which was in higher estimation at that period, than it is now; he was also appointed one of the privy-council; and in 1534 rose to the posts of principal secretary of state and master of the rolls. In the following year he took an active part in the suppression of the monasteries, for which purpose he was made visitor-general, and is said to have exercised the office without any regard to the principles of justice or humanity. His services were, however, rewarded by the king, who advanced him to the post of lord-keeper of the privy-seal, and to a seat in the house of peers, by the title of lord Cromwell of Okeham. After the abolition of the pope's supremacy, lord Cromwell, under the title of king's-vicar-general, was placed at the head of the whole ecclesiastical power in the kingdom. His influence in this situation he employed in favour of the reformation, to which he was apparently much inclined from conviction, having in early life committed to memory Erasmus's translation of the New Testament, and having been prepossessed in favour of the principles of the reformers during his residence in the Low Countries. Without referring to the minuter acts by which he promoted the cause which he had espoused, we may observe that he encouraged an English translation of the Bible, of which, when finished, he directed a copy to be provided for every parish church. This in those times was the most important and truly valuable gift that could have been made to a parish. Honours were still increased on the head of lord Cromwell; he was appointed chief justice itinerant of the forests beyond Trent, and in 1539 was advanced to the dignity of earl of Essex, and lord high chamberlain of England. His fortune and his property in land were augmented in full proportion to his rank in life; he obtained many noble manors and estates out of the wrecks of the religious foundations. Envy and ill-will were, however, the constant companions of his good-fortune; he had in various instances laid himself open to his enemies, who never failed to take every advantage of his failings. The clergy hated him for his exactions on their body; the ancient nobility despised him on account of the meanness of his origin, and his sudden elevation to the highest distinctions of the state. To the friends of law and justice, his arbitrary proceedings against the innocent, or at least against those who were not permitted to defend themselves, rendered him justly obnoxious. He had been chiefly instrumental in procuring the condemnation of the countess of Salisbury and the marchioness of Exeter, on charges of high treason. Under such circumstances he could scarcely hope to finish his course without some reverse, especially since his only security was the will of a prince who was guided by no principle but that of gratifying his own passions at any price. Cromwell had recommended Anne of Cleves to Henry as a wife; from her he hoped for support in the cause of the reformation, being a Lutheran. Her person did not answer the expectations of the king; he determined to dismiss her, and to avenge himself on Cromwell, who had been the means of uniting them. He was accordingly arrested at the council table by the duke of Norfolk, a zealous catholic, on the charge of high treason; and, in conformity to the wicked precedent which he had given, he was condemned without being permitted to justify himself. He pleaded by an humble petition with the king; thrice was the prayer of the supplicant read to his majesty, but he was inexorable; the great men of the earth rarely forgive, and Henry VIII. was not an exception to this rule. Cranmer, whose character we have already discussed and appreciated, was the only friend who ventured to acknowledge Cromwell in his misfortune: he wrote to the king, attesting from his own knowledge, the loyal attachment of his faithful

servant, and affirming, that "he loved his majesty no less than his God." The decree was however passed, and Cromwell was beheaded on Tower-hill, July 28, 1540, declaring with his latest breath that he died in the catholic faith; which is scarcely to be accounted for on any principles of human action. Thus fell Thomas Cromwell, earl of Essex, under the weight of a tyrant's displeasure, whom he had served with fidelity, courage, and resolution, in the most hazardous, difficult, and important undertakings. Mr. Hume denies that there were any grounds for the impeachment of lord Cromwell of treason, but admits that he justly merited his fate, for suffering himself to be the instrument of the king's tyranny in the case of the countess of Salisbury and others. "He was," adds the same historian, "a man of prudence, industry, and ability, worthy of a better master, and of a better fate." Mr. Gilpin, speaking of his condemnation, remarks, that "among all the arts of expediency, laid up in the cabinets of princes, the readiest is to sacrifice a minister. The death of Cromwell was represented to the king as the best mean of composing the people. But though prudential reasons may oblige a prince to discard a minister, yet guilt only, and that nicely examined, can authorize an act of blood; the hand of a tyrant, however, generally throws aside the balance. It is a nice machine, and requires pains and temper to adjust it. The sword is an instrument more decisive, and of easier dispatch. Henry's was always stained with blood—often with innocent blood—but never with blood more innocent than that of Essex." *Biog. Brit.*

CROMWELL, OLIVER, one of the most distinguished characters in English history, who raised himself to supreme power, from an obscure situation, was son of Robert Cromwell and Elizabeth Stuart, his wife, and born at Huntingdon, on the 24th of April, 1599. At the free-school in this town he received the early part of his education, which he completed at Sidney college, Cambridge. His attainments in literature were by no means considerable; and he has been charged with exhibiting, in his youth, all the turbulence of temper which was compatible with a system of scholastic restraint. The death of his father called him home from Cambridge, and in a short time after he was entered at Lincoln's-Inn, but, in the interval, the want of employment afforded him scope for indulgence in certain irregularities which gave his mother much uneasiness. In London he paid but little attention to the law, for the study of which he was intended, but giving into the vices of the town, he involved himself in expences, which the smallness of his fortune would ill support, and reduced him to difficulties. Still, however, he has the apology usually made, in like circumstances, for youth; as he married before he had attained to the age of twenty-one, the daughter of sir James Bouchier, and from this period he began to lead a grave and sober life. By the death of his uncle, a few years after his marriage, he came in for an estate of nearly 500*l. per annum*, which he had endeavoured to obtain before, by applying for a statute of lunacy against his relation. Previously to this, he had been returned member of parliament for the borough of Huntingdon; but, on coming to his fortune, he removed to the Isle of Wight, neglected the church, in which he had been educated, and openly joined himself to the Puritans. In 1628, he was elected member of parliament, and was shortly after appointed on the committee of religion, in which he distinguished himself by his zeal against popery, and by complaining of the bishop of Winchester's licensing books of a very dangerous tendency. During the recess from public business, he associated much with the ministers who had been silenced, and

invited

invited them to perform religious services at his own house. By the support which he gave to their cause, and by his retribution to persons of property, of that which he had formerly gained by gambling, his affairs became again very much embarrassed. In the hope of adding to his income by honest industry, he took a farm at St. Ives, which he held about five years, without experiencing those gains which he had anticipated. Uneasy at his present embarrassed situation, he formed the project of embarking for the Western world, which he would probably have put into execution, had he not been prevented by a proclamation against emigration. He now appeared in various useful concerns as a man of business, and was regarded by his friends as one designed for matters of higher import than fall to the lot of the generality of mankind. Oliver was elected member of the Long Parliament, for Cambridge, in the year 1640. From this event his future greatness is to be dated. In the house he was zealous and assiduous, and a very frequent speaker, which gave him a considerable degree of influence, though he was deemed inelegant in his manners, and in his person he was remarkable slovenly and careless as to his dress. In 1641, he was the most active person in carrying the Remonstrance, which was, in fact, the basis of the civil war, and which was gained by a majority of nine only. This remonstrance, of which we shall have occasion to speak more at large under the article ENGLAND, contained a concise history of the enormities of Charles's government, the evil counsellors who had guided and did guide him, and the mischiefs which they had been meditating against the house itself, for their opposition to, and correction of, abuses. It occasioned a debate that lasted from noon, till ten o'clock the next morning, which has led some historians to compare the decision to the verdict of a half-starved jury: it was, however, of so much importance to the cause of the opposition, that many from this time, who had been wavering in their politics, gave a decided voice against the measures of the court, and it dispirited such as adhered to the king so powerfully, that, from this period, they ventured to make no resistance. Cromwell's firmness on the occasion, contrary to the wishes of many leading men on the same side, who were willing to put off the discussion, was the principal cause of success, and it so recommended him to Hampden, Pym, and others of the same party, that, from henceforward, they admitted him into all their councils. Naturally of a clear and penetrating mind, he soon obtained an insight into every subject that was deemed of importance at the time, and so perfect a knowledge of his contemporaries, and of all their designs, that he was not only able to manage when they were removed, but even to contrive the means of dismissing some, who, at this crisis, looked upon themselves as his superiors.

In the beginning of 1642, when parliament had determined upon the levy of forces, he went to Cambridge, where he raised a troop of horse, of which he took the command by a commission from the earl of Essex. Though subject to a higher authority, he engaged, of his own accord, in some spirited enterprises, which were very beneficial to his party. The celebrity that he acquired as a soldier laid the foundation of the greatness to which he afterwards attained as the ruler of the country. His successes enabled him to increase his force, and he found himself in a very short time colonel at the head of a thousand well-disciplined horse-soldiers. Cromwell uniformly selected persons of religious principle, who felt a zeal for the business in which they engaged, rightly judging that men of abandoned characters are never, on trying occasions, to be trusted. His levies consisted of his countrymen, substantial yeomanry,

and their sons, whom he trained in excellent discipline, and rendered valiant by example and instruction. Cromwell has often been charged with hypocrisy, and where dissimulation answered his ends, he doubtless made no hesitation in calling it in to his aid; but in this business he adopted the line of manliness and true courage: in addressing his men, he said, "he did not mean to deceive them, by pretending to fight for king and parliament, for should the king himself be found in the opposite army, he would as soon fire his pistol upon him as upon another man."

Without attempting to trace the detail of Cromwell's military transactions, which will be given hereafter, we may observe that by various important services he acquired the complete confidence of parliament, and was in the year 1643-4 made lieutenant-general of the horse in the army of the duke of Manchester, and in the battle of Marston-moor, July 3, 1644, his cavalry turned the fortune of the day, and gave the first severe blow to the royal party. He next distinguished himself at the battle of Newbury, in which his valour was so conspicuous, and the effects arising from it so very important, that he was styled by his party "The Saviour of the Nation." By the discerning and the wise, his motives were suspected; and his conduct was impeached in the house of lords as worthy of particular notice. He, on the other hand, exhibited charges of considerable moment against some members of the upper house. These accusations led to the carrying of the "self-denying ordinance," the professed object of which was to exclude the members of both houses from commands in the army. By this measure the earl of Manchester, the principal enemy to Cromwell, and other persons of rank and consequence, were excluded from offices in the army: from which, however, on the score of his extraordinary merit, that set him above all ordinances, Cromwell was at first occasionally, and at length absolutely exempted. The chief command of the army was now committed to sir Thomas Fairfax, a man of undoubted bravery, and unimpeachable integrity, but unfit to cope with Cromwell, who was lieutenant-general of the army. On the 15th of June, 1645, he distinguished himself by the most brilliant exploits in the battle of Naseby. On that occasion he had the command of the right wing, and after Ireton had been beaten, and rashly pursued out of the field by prince Rupert, it was Cromwell's charge which broke the king's infantry, and secured a complete victory. He followed up the success of the day with other actions of high merit, and was rewarded by parliament with 2500*l.* *per ann.* and when he resumed his seat in the house, thanks were returned to him in the warmest expressions, which he received with an affected humility, and declarations of profound submission to the will of that assembly. Those who, in parliament, had excited the war, for the sake of redressing grievances, and to set some bounds to the prerogative, were now desirous of peace, to which they conceived nothing would so much contribute, as having the king's person in their hands. For this purpose sir Thomas Fairfax was ordered to besiege Oxford: the king however contrived to escape, and put himself into the hands of the Scots, who, at length, scandalously gave him up on condition of receiving a stipulated sum of money. Parliament, having thus attained their object, was desirous of disbanding a part of the army. Cromwell, whose overgrown authority this measure was meant to check, contrived to turn it to his own advantage; and procured from the general regulation an exception for Fairfax's army, which was in fact his own. From this period, the ways of Cromwell were directed by a policy very difficult to unravel. Ambition was doubtless the passion that had fastened on his mind: he fought for power, and

CROMWELL.

was careless as to the means of attaining his object. He professed principles of deference and respect for the parliament, which he probably held in contempt: under the mask of friendship for the fallen monarch he was plotting against his life. By his instigation, the king's person was seized by Cornet Joyce, who had no orders but the verbal instructions of Cromwell for what he did. When Charles was taken to head-quarters, the behaviour of the lieutenant-general was so respectful, that it was thought he meant to restore him to his lost crown: he obtained a letter from the army to parliament to declare that their cause and that of the king was the same. By the arts of Cromwell, the king left Hampton Court, where he seemed to be gaining importance, and put himself into the hands of the governor of the Isle of Wight, a person devoted to the interests of Cromwell. A second civil war in defence of monarchy called him again into the field: he marched into Wales, quelled an insurrection there; from thence he marched into Scotland, put the power into the hands of the other party, and made arrangements conformably to his own wishes, and then returned to London. In the mean time parliament opened a treaty with the king, which might have been concluded, had not Cromwell interfered: a detachment of the army seized the king's person, and lodged him in Hurst castle, which was at first resented by the parliament, who commanded the general to recal his orders; but instead of this a part of the army marched directly to London, took possession of it, purged the house of commons of the best part of its members, and obliged the remainder to do what they pleased. The fate of the king was now drawing near, and it must be admitted that Oliver Cromwell was the prime mover in the cruel and bloody deed. He acted the hypocrite, and would willingly have kept through the whole business, in the back ground; but finding that his own energy was requisite to accomplish it, he came forward in the most public manner: he sat in the court, signed the warrant, and probably procured not only the execution, but the executioner, whose name and character have never yet been fully ascertained.

The constitution of the country was now destroyed, and in the stead of one sovereign, there were nominally many, under the name of a Council of State, but Cromwell, who formed it, was the principal member. The spirit of the army, which he had fostered for his own purposes, seemed to rise against him; a mutiny broke out, which, however, by his vigilance and resolution, was quelled without much serious mischief. He was next called to Ireland, where three parties were opposed to each other, *viz.* the native catholics, the royalists, and the friends to the parliament. He went out in 1649 in quality of lord lieutenant, with ample powers, and with a full determination of reducing all to order. Here he practised the utmost rigour of the law of arms, and murdered a multitude of people who opposed his projects, under the milder title of military execution, a phrase, which by others, as well as Cromwell, has been used to justify the most savage outrages against humanity. At Drogheda he is said to have given up to the sword more than 2000 veteran troops; and at Wexford, women and children did not escape his fury. By these means he reduced Ireland to obedience, and returned to London in the following spring, where he was received by the thoughtless multitude with the most triumphant exultation.

Soon after his return, it was discovered that the Scotch had invited Charles II., and were preparing an army in his support. Cromwell recommended a previous invasion of Scotland, and was himself appointed general commander in chief of all the forces of the commonwealth, still keeping

the lieutenancy of Ireland. Cromwell marched to Scotland at the head of 20,000 chosen troops, a still larger army was raised to oppose him, which in the first contest were proved to be unequal to contend with the invaders. The battle of Dunbar, fought Sept. 3, 1658, terminated in a complete victory over the Scots, with great slaughter. Edinburgh castle fell in consequence of this decisive blow, and Cromwell reaped various other important successes. In the mean time, Charles determined upon trying the strength and attachment of his friends in England. Cromwell followed him, and at Worcester on the 3d of September 1651, he obtained over the royal army what he denominated his "crowning victory," attended with the total destruction of his opponents. He now proceeded to London, where he was hailed with all the honours due to a conqueror and deliverer of his country. He was met by the parliament and its speaker, the council of state, and the magistrates of the city, who were assembled to render him the praise due to his successful labours. A day of thanksgiving was appointed, and Cromwell himself was rewarded with 4000*l.* a year, taken from the forfeited estates. From this period he began to concert measures for securing to himself the supreme power. The Long Parliament had become exceedingly unpopular in the country; they had long talked of dissolving themselves, but had always found pretexts for putting off the time to a more convenient opportunity. Cromwell took advantage of the odium which attached to an assembly that appeared determined to maintain the powers originally delegated to them for their country's good, with a view to the sordid purposes of self-interest. He resolved upon a decisive measure: he founded his friends, and talked to them of "*stabilising the kingdom*," a phrase made use of to cover his real designs. He was well acquainted with human nature, and in every instance, he contrived to make persons of different views, and almost opposite habits, suppose that their intentions, as to the remedy of evils, coincided with his own. To the sober and religious, he complained of the scandalous lives, and dissolute manners, of certain leading republican members. He exposed the pride of some, the fraud of others, and the interestedness of all, except those to whom he was immediately addressing himself. With the fifth-monarchy men, he conversed in their own style, professing a desire that the saints should reign; but his real design he kept profoundly locked in his own bosom; so that all who were desirous of a change, were willing to aid him in his efforts, upon the full persuasion that it would be such a change as they themselves wished. Having thus prepared the way, on the 19th of April 1653, he called a council of officers, explained his designs, took a party of 300 soldiers, whom he placed about the avenues to the parliament-house, and entered himself, as a spectator of their proceedings. They were debating the necessity of continuing as a house till the November of the following year. Displeased with their arguments, he called major general Harrison, and told him that he thought this was the proper moment for a dissolution. Harrison urged upon him the danger of the business: as if satisfied with his reasons, he remained quiet a few minutes, till the very moment when the speaker was about to put the question for passing the act of continuing their duration, he then started up, and bade the speaker to proceed at his peril: he commanded him to leave the chair, and told the house in a vehement tone that they had existed long enough, for the good they had performed. He then addressed individuals, charging them with vices which they probably could not deny, and for which they had no expectation of being called to account. A few of them attempted to reply; but his object was not de-

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bate, but decision. "Come, come," said he, "I will put an end to your prating.—You are no longer a parliament; I say you are not a parliament;" and stamping with his foot, he bade them for shame begone, and give place to honest men. The soldiers instantly entered the house, one of whom he commanded to "take away the bauble," meaning the mace. An officer, at the same time, took the speaker by the arm, and led him down from his seat. After which, with a degree of canting hypocrisy that never was surpassed, he addressed the house, saying, "It is you that have forced me upon this business, for I fought the Lord night and day, that he would rather slay me than put me upon the doing this work." To conclude the scene, he seized the books and papers, turned the members out of the house, and locked the doors. His next step was to dissolve the council of state, after which for a few days he governed by his own authority, calling to his aid a council of officers. Shortly after a new representative body was summoned consisting of 142 members, who from their numbers were styled the *Little*, from their manners the *Godly*, and from the name of one of its members, "Barebon's parliament." This body were found unequal to the charge which they had undertaken; the greater part from a sense of weakness resigned their power into the hands of Cromwell, and the rest he forcibly dismissed. The supreme power again devolved upon the officers, who conferred upon Cromwell the office of PROTECTOR OF THE COMMONWEALTH OF ENGLAND, SCOTLAND, and IRELAND. This happened Dec. 16, 1653, and he was solemnly invested with the high trust in Westminster-hall, and from this time he must be considered as the sovereign of a great nation; his power was almost boundless, but he exercised it with prudence and dignity. He applied himself to state affairs, made peace with Holland, and entered into treaties with Denmark, Sweden, and Portugal. France and Spain appeared ambitious of his friendship, and the general state of Europe was such as to give to England a large share of consequence among surrounding nations. In his domestic administration, he was an enemy to religious persecution; and shewed a respect for the rights of conscience. He displayed a zeal for justice, but was extremely severe in punishing conspiracies against the state, as he denominated those which were levelled against himself. He summoned a parliament, in which Scotland and Ireland were united in sending representatives, and obtained by this method a supply of money necessary for the carrying on of government. This body was not sufficiently obsequious to his will, and he dissolved it in about five or six months. In 1655 an insurrection broke out in the west of England, but Cromwell was too well informed of all the proceedings to feel any anxiety on this head; his numerous spies, and no monarch had more, gave him constant intelligence of every thing that passed, and he suffered the mal-contents to proceed far enough to involve themselves in the penalties of treason, and then crushed them with a blow. Economy and frugality were not characteristics of Cromwell's reign, and the want of money led him to the seizure of property belonging to the king of Spain, which excited a war chiefly carried on in the West Indies. In that quarter the result was not highly favourable to the English, unless in the subjection of Jamaica, which has continued ever since attached to this country. But the successes of admiral Blake in the Mediterranean gave great importance to the protector's government, and raised him high in the opinion of foreigners. France was glad of an alliance, upon the condition of banishing the Stuart family from her realms, and giving up Dunkirk to England; and a splendid embassy from Sweden was sent and received with great parade.

After the dissolution of parliament, Cromwell's government

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might fairly be denominated a despotism, for the money was raised by his own decrees without the intervention of the people. He issued, among other mandates, one for inflicting the penalty of the tenth of the annual income upon all those who had borne arms for the king, and commissioners were sent into the several counties to levy the same, who were empowered to compound for the same on the terms of a three years' purchase. Such in those days were the penalties of high treason.

In the year 1656, Cromwell had recourse to another parliament in order to obtain the necessary pecuniary supplies; after he had obtained these he aimed at extorting from them the title of king, but his expectations not being answered, he contented himself with that of protector; he then attempted to form a new house of peers, but the ancient nobility refused to associate with the sons of the protector, and others whom he was anxious to raise to a similar rank. About this period a pamphlet was written and circulated, entitled "Killing no Murder," insisting upon the right of tyrannicide; this work, which was the production of Titus, an officer in the army, made so deep an impression on the mind of Cromwell, that he probably never enjoyed one hour's solid peace after the refusal. New conspirators were discovered, and many suffered, some in consequence of projects discovered before they could be attempted, and others to allay the fears of the usurper. Among these were sir Henry Slingsby, and Dr. Hewett, a clergyman of the church of England; for the latter every interest was made, particularly by the protector's favourite daughter, but the irrevocable sentence was passed and carried into execution. She fell sick, and with almost her last breath execrated the cruel policy that took away the life of her friend. From this time the health of the protector began visibly to decline; and the cares and the fears, connected with his greatness, were doomed to bring him to a speedy end. A slow fever terminated his existence September 3, 1658. He does not appear to have expected this termination of the disease; he maintained, in opposition to the opinions of his physicians, the certainty of his recovery; but took the precaution to make his will, in which he bequeathed the reins of government to his son Richard, and to Henry his other son he left the governorship of Ireland. He was interred with great pomp in Westminster Abbey. He died at a period when, according to the opinion of bishop Burnet, "his life and his arts were exhausted together, so that if he had survived any longer, he would scarcely have been able to preserve his power." The fabric of his greatness was false and unsound. By cunning and deceit he had attained his high situation; these seemed to render him the less assistance the longer he lived, and it is probable that in a very few years, or even months, they might have served him no more. His own children are said to have been all foes to his government, either royalists or republicans from principle; and, perhaps, says one of his biographers, "there was not a person in the nation sincerely attached to, and a well-wisher of his government." It were in vain to look for a disinterested account of the character of this great man, for great, in the common acceptation of the word, he unquestionably was, among those who were the witnesses of his life and conduct. No two writers in the present age seem agreed as to the degree of merit or demerit to which he is entitled. We shall, however, quote the opinion of Mr. Granger, who has indeed drawn different sketches of him. "Oliver Cromwell," says he, "united in a very high degree, the characters of the politician and general, and occasionally assumed those of the buffoon and the preacher. He broke forth from his obscurity, at an age when others think themselves doomed to it for ever; and

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when many begin to entertain thoughts of retiring from the world, he began to make the most conspicuous part in it. He availed himself of the virtues and vices, the talents and weaknesses, of mankind; and such obstacles as would have been insurmountable to an inferior genius, helped greatly to carry him on in his career."—"He is," says the same writer, "an amazing instance of what ambition, heated by enthusiasm, restrained by judgment, disguised by hypocrisy, and aided by natural vigour of mind, can do. He was never oppressed with the weight, or perplexed with the intricacy of affairs; but his deep penetration, indefatigable activity, and invincible resolution, seemed to render him master of all events. He persuaded without eloquence; and exacted obedience, more from the terror of his name, than the vigour of his administration. He appeared as a powerful instrument in the hand of Providence, and dared to appeal to the decisions of heaven for the justice of his cause. He knew every man in the three kingdoms, and endeavoured to avail himself of their respective talents. He has always been regarded by foreigners, and of late by the generality of his countrymen, as the greatest man this nation ever produced. It has been disputed which he most deserved, a halter or a crown, and there is no less disparity betwixt the characters drawn of him, and the reports propagated by his enemies and his friends." *Biog. Brit. Harris's Life of Cromwell, &c.*

CROMWELL, RICHARD, eldest son of the protector, was born at Huntingdon, in 1626, where he received his grammar learning. When he was about 20 years of age, he was entered at Lincoln's Inn, being probably intended for the bar, but he was too much attached to his pleasures to make any considerable progress in his legal studies. Neither in this, nor in any period of life, had he the ambition to distinguish himself. His political opinions were opposite to those of his father, and he had not the smallest taste for military distinction. It is said that he pleaded, on his knees, for the life of Charles, and it is well ascertained that he joined the party who wished success to the cause to which his father was the most formidable enemy. By the protector he was raised to some offices of distinction, and was one of his new peers. Richard rather acquiesced in his fate, than felt proud of the honour which he then enjoyed, and which, as the heir of Oliver, he might reasonably anticipate. Upon the death of his father, he succeeded to the government, and received the accustomed homage, with addresses from all parts of the nation. His title and claim were acknowledged by continental powers, and, for a few months, every thing went on very smoothly. A parliament was then necessary, which, though called in the usual manner, exhibited some alarming symptoms of opposition; disaffection appeared also in the army. In this exigence, Richard advised with his privy council, who recommended a dissolution of the parliament, with which he complied, and this act may be considered as the real termination of his power. He retained, indeed, the name and the appearance of protector a few days longer, though without any degree of authority, and his reign was finally ended by the resolution of the council of officers to invite the surviving members of the Long Parliament, to return to the exercise and discharge of their trust. By some of his friends Richard was advised to retain his power by force, and to cut off those men who were aiming to deprive him of sovereignty. But he despised their council, and spurned the thought of retaining power at the expence of blood. He quietly submitted to all the sacrifices that were required, and was particularly anxious that he might be freed from the debts which the splendour of his father's funeral seemed to fix upon him. Parliament

gave him security for this purpose, and promised a liberal provision for himself and family. At the restoration he thought it right to retire to the continent, though there seems to have been no intention on the part of the king or his ministers to molest him; and so completely was he forgotten, that his name was not once mentioned in either house. For some years he resided at Paris, under a feigned name, and in great obscurity; from thence he went to Geneva, and about the year 1680 he returned to England, and fixed his residence at Theobald in Hertfordshire, under the name of Clark, where he lived much respected by those who enjoyed his acquaintance. He died in the year 1712, in his 86th year, a happier and a better man than his father, but possessed of none of those qualities that attract notice or lead to celebrity. He is described as an excellent character, possessing in his latter years great gravity and real piety. He was endowed with many amiable qualifications, and was much beloved by his friends, with some of whom he kept up a correspondence to his death. He had been married, and left three daughters, who some years before their father's death had attempted to deprive him of his property; by an appeal to the law, he obtained his right, and was afterwards reconciled to his children, whom in his last moments he recommended to "live in love, as he was going to the God of love." *Biog. Brit.*

CROMWELL, HENRY, the youngest surviving son of Oliver, was born in January 1627-8, and at the age of 16 was introduced to military service. In 1649, he accompanied his father to Ireland, where he attained the rank of colonel. He returned, and was elected member of the "Barebone's Parliament," but was afterwards sent to Ireland in a political capacity, and at length was lord-lieutenant of that kingdom. In every situation he acted his part with honour, and was generally respected. Such indeed was the integrity of his character, that in a letter to his brother, he said, "I will rather submit to any sufferings with a good name, than be the greatest man upon earth without it." Upon the restoration of Charles, he lived quietly as a private gentleman, and took no part in the various changes of the state. It is thought that he rejoiced in the succession of the king to his crown, and he was not only included in the act of indemnity, but received some marks of favour from the king, of which he expressed a very grateful sense, in a letter to lord Clarendon, through whose interposition the benefit was obtained. He died in the 47th year of his age, and was buried near his mother. After the restoration he conformed to the church of England, and died in that communion. Many are the testimonies to the excellence of his character: we shall only notice that of Mr. Neal, who says, "that he was a wise and discreet governor: that by his prudent conduct he kept the Irish in awe; that he brought that nation into a flourishing condition; and that he behaved with such generous impartiality, as gained him the esteem even of the Royalists themselves." *Biog. Brit.*

CROMYON, in *Ancient Geography*, a burgh of Corinth, situated on the gulf to the east of Sclærus. It is pretended that it took its name from Cromus, the son of Neptune. In the first times of Greece, this was the place where the monster of cruelty, called *Sinis*, fastened the limbs and arms of travellers whom he apprehended to branches of the pine-tree, which he bent to the ground; and then giving them liberty to restore themselves, they thus tore to pieces the unfortunate wretches, whom the savage monster doomed to this kind of death. Tuceus is said to have destroyed him in the same manner. Pausanias mentions the fact, and says that these cruelties were practised towards the point of the

the Isthmus. Here was an altar of Melicertes. When Ino's mother plunged herself with him into the sea, in order to preserve him from the cruelty of his father, the fable says that a dolphin brought her to the shore, and that Sisyphus finding the body, interred it in this place, and instituted in honour of her the *Isthmian* games.

CRONACA, SIMONE, in *Biography*, a Florentine architect, born in the year 1454. He travelled to Rome and other cities of Italy to study and take exact measurement of the antique edifices. Returning to Florence he acquired considerable reputation, and was employed to finish the Palazzo Strozzi, begun by Benedetto da Maiano. Amongst his other works at Florence are the "Sagresty of the Church of Santo Spirito, and the Church of S. Francesco del Osservanza," at S. Miniato, in the suburbs of that city. He died in 1509, and was buried in the church of St. Ambrogio. *Vafari*.

CRONACH, in *Geography*. See **CRANACH**.

CRONBERG. See **CRONENBURG**.

CRONE, in *Rural Economy*, a term applied to sheep, which denotes an old ewe. Thus in speaking of the aged stock of this sort, they are usually denominated crones.

It is stated by the author of the Farmer's Calendar as a common system of management in inclosed districts, to buy in old crones in the month of September, to put the ram to them in the following month, and to dispose of the lambs as they become fat in the ensuing summer and autumn, so as to clear the whole within, or at most in about a year from the period of buying them in.

And this is supposed a tolerable method of management in cases where the fences are in a perfectly secure condition, and the food in great abundance, though in general inferior to the system of wether lambs. See **SHEEP**.

Crone stock is, however, considered by the author of the Minutes of Agriculture as a very unprofitable sort, especially where the chief spring food is turnips, as they are not, from their want of teeth, capable of breaking them in a manner so as to go on well with such kinds of food.

CRONE, or **KORONOW**, in *Geography*, a town of Prussia, in Pomerania; 56 miles south of Dantzick.

CRONEBANE, a mountain in the county of Wicklow, Ireland, rising about 1000 feet above the level of the sea, which, with Ballymucktagh, is noted for its copper mines. The chief line of the metalliferous vein extends from the hill of Cronebane to that of Croaghan, nearly ten miles in length. The former of these mines is wrought by a chartered company with much scientific art. The species of ore which is found here is the most common of copper ores, called copper pyrites. Copper water, or water in which sulphate of copper is dissolved, is found in these mines, and it is accounted one of the strongest in Europe. Its strength however depends upon the quality of the copper. The attention of the traveller will be repaid by an investigation of the process by which this water deposits almost pure copper ore. The ore is fused at Aiklow, but afterwards farther refined at Swansea or Neath, in South Wales. The ground around these mines was lately bog and rock, but by the exertions of captain Mills and Mr. Weaver, its appearance is now altered, and it produces excellent crops. These mines are situated between Rothdum and Aiklow, about 28 miles south from Dublin. *Robertson's Guide*.

CRONEBORG, or **TAWASTEHUS**, in Latin *Cronenburgum*, a small town of Swedish Finland, chief place of the province of Tavastland, on a river which empties itself into the lake of Wana, 63 miles north-west of Borgo, 75 north-east of Abo. It was built in the year 1650, in a pleasant situation, by count Peter Brahe, and favoured with consi-

derable privileges. In 1717, it was taken by the Russians, and has always suffered considerably during the wars between the Russians and the Swedes. Croneborg has the hundredth vote in the Swedish diet. The castle, which is very strong, ought to be exclusively denominated Tawastehus or Tawasteborg. It is used as an arsenal and military magazine. When the Russians invaded Finland in the latter end of February 1808, the Swedes retired under the walls of this castle, and took a concentrated position in its neighbourhood.

CRONENBURG, a small town of France, in the department of the Oulle, chief place of a canton, in the district of Malmédy, with a population of 639 individuals. The canton has five communes, and 2454 inhabitants, upon a territorial extent of 135 kilometres.

CRONENBURG, or **CRONBERG**, a strong castle of Denmark, in the island of Zealand, on the west coast of the Sound, near the town of Ellsineur, built by Frederick II. in 1756, for the purpose of defending the entrance of the Sound, which is only 1331 fathoms wide opposite the castle. It is constructed with large blocks of hewn stone, and adorned with several turrets. The fortifications are reckoned excellent. However, the guns of this castle could not prevent the passage of the English fleet under admirals Parker and Nelson, in March 1801. Every vessel in passing lowers her top-sails, and pays a toll at Ellsineur. This fortress, it is generally said, guards the Sound; and all ships are obliged, on account of shoals and currents, to steer so near the batteries as to be exposed to their fire, in case of refusal. This notion, however, is erroneous: although the safest passage lies near the fortress, the water in any part is sufficiently deep for vessels to keep at a distance from the batteries, and the largest ships can sail even close to the coast of Sweden. The constant discharge of the toll is owing, not so much to the strength of the fortress as to a compliance with the public law of Europe. Many disputes have arisen concerning the right which the crown of Denmark has to impose this duty. The Swedes were for some time exempted by treaty; but, in 1720, Frederick I. agreed that Swedish vessels should be subject to the usual imposts. All vessels, besides a small duty, are rated at 1½ per cent. of their cargoes, except the English, French, Dutch, and Swedish, which pay only one per cent.; in return, the crown takes the charge of constructing light-houses, and erecting signals to mark the shoals and rocks, from the Cattegat to the entrance of the Baltic. The tolls of the Sound, and of the two Belts, supply an annual revenue of above 100,000*l*.

It was in the palace which stands in this fortress that the unfortunate queen Carolina Matilda of Denmark, sister to king George III. of England, was confined in 1772; from hence she was removed to Zell, where she died of a scarlet fever. This palace is a square Gothic building of free-stone. From an inscription over the gate, it appears that it was begun by Frederick II. and has been repaired and augmented by succeeding sovereigns. It contains two good portraits of Frederick II. and Christian IV. and several battle-pieces representing the wars of Christian V.

Adjoining to another royal palace, about half a mile from Cronenburg, is "Hamlet's garden," which tradition reports to be the identical spot where the murder of his father was perpetrated.

CRONICAL, in *Astronomy*. See **ACRONICAL**.

CRONIUM, in *Ancient Geography*. See **CROMYON**.

CRONIUM Mare, a northern sea, which, according to Pliny, was one day's sail beyond Thulé. It is called "Mare Pigrum"

Pigrum" by Tacitus; and is now denominated the Icy or Frozen sea.

CRONIUS, in *Chronology*, the ancient name of the Athenian month Hecatombæon, which was the first of their year, and answered to the latter part of our June, and beginning of July.

There were feasts called *croniones*, celebrated at Athens in this month, in honour of Saturn, answering to the *Saturalia* of the Romans.

CRONIUS *Mons.* in *Ancient Geography*, a mountain of Greece, in the Peloponneseus. Dionysius of Halicarnassus places it before Alphæus, in the territory of the town of Pylæ.

CRONBERG, in *Geography*, a small town of Sweden, in the province of Smoland, on an inconsiderable island in the Helge lake, which formerly had a very fine castle, the ruins of which are still seen. It was built in 1002, by St. Siegfried, the first preacher of the gospel in those parts, and given to the bishop of Wexie, for which reason it was called Bishop's-berg or Bishop's hill. But in the year 1545, it was enlarged and walled in by king Gustavus I., when its name was changed into that of Cronberg, Crown's hill.

CRONSWITZ, a town of Germany, in the circle of Upper Saxony, and territory of Neustadt; two miles north-east of Weyda.

CRONSLÖT, or KRONSCHLOSS, *Crown Castle*, is a fort built in the year 1703 by Peter the Great of Russia, on a small island in the gulf of Cronstadt opposite the fort of St. Alexander. It defends the only passage through which ships of burthen can sail from the gulf of Finland to Peterburg; its fortifications project into the water; it mounts several batteries, and generally has a garrison of 100 men.

CRONSTADT, or KRONSTADT, a sea port town in the northern division of Russia, in the government of Peterburg, built by Peter the Great in 1710, on the island *Retufari*, called by the Russians *Kotloi*, or *Kotlinnoi Ostraf*, the kettle island, but since the year 1723 better known by the name of Cronstadt. It lies 39 versts west-north-west of Peterburg, at the eastern extremity of the gulf of Finland, which, from this isle to Peterburg, is denominated the gulf of Cronstadt. It is not more than eight fathoms above the level of the water, rather flat, about seven versts long and one broad; has some wood, chiefly birch; and its soil is clay, sand, and limestone. At the eastern extremity of the island is the town of Cronstadt. Near it on the south side are two small fortified islands called St. Alexander and Cronslot. There is a third island on the northern side of the channel smaller than either, named St. John.

Ships of war, frigates, and merchant vessels, whose masts exhibit a huge impervious forest; fortifications of granite projecting into the water, and spacious and lofty magazines give to the harbour of Cronstadt a magnificent appearance at a distance: but the town itself answers not the expectations which this appearance excites. There are but few good houses. It is a straggling place, and like all Russian towns, occupies a larger space of ground than the number of habitations, which are mean and mostly of wood, seems to require.

There are three different harbours. That to the east, in which the greatest part of the Russian Baltic fleet is laid up, holds 25 large ships of war, but its issue is difficult, and the water being rather fresh, accelerates the wear of the vessels, and causes them to rot. The middle harbour is for frigates, sloops of war, and yachts belonging to the crown. The harbour to the west is appropriated to merchant ships, and may hold six hundred vessels. Close to it

is the Peter's canal, which derives its name and its origin from Peter the Great, the immortal founder of Cronstadt. Two fine obelisks bear inscriptions commemorative of this great undertaking.

Dry-docks for the refitting of men of war were begun by Peter at Cronstadt, in the year 1719, but neglected under his successors, and not completed before the reign of his daughter Elizabeth. Ten ships may be put upon the blocks at the same time. The docks are provided with flood-gates for admitting and letting out the vessels, and the water is emptied into a vast basin of granite, from whence it is pumped into the docks by means of a large steam engine erected by the Carron company of Scotland in the year 1772. The length of these works from the beginning of Peter's canal to the last dock is 4231 feet. The docks are lined with stone and paved with granite. They are 40 feet deep, and 105 broad. There is also a foundery for casting cannon balls, and a rope-walk for cables of all sizes.

Another canal was completed soon after the death of Catharine II., by means of which vessels of all sizes are enabled to take in their stores at the very gates of the magazines built on both sides of the canal, which, like the Peter's canal, is lined with brick-work.

The marine hospital at Cronstadt is on a very extensive scale. In 1788 it had at different times 25,007 patients; in 1789, 16,809; of the former 20,924 were cured, of the latter 12,974.

The academy for cadets of the marine was removed towards the latter end of the reign of Catharine II. from Cronstadt to Oranienbaum, from whence the emperor Paul transferred it to the Vassili Ostrof quarter at Petersburg.

The population of Cronstadt is estimated at 30,000 individuals; most of whom belong to the fleet, and to the garrison.

The number of registered burghers does not exceed 300. The streets are thronged with mariners from all the ports of Europe. There is an English chapel, and a Lutheran church for the Germans.

Cronstadt, being seated on a small island, has no other communication with the adjacent country than by water. Boats are continually passing between Cronstadt and Oranienbaum, a distance of seven versts, which in still weather is crossed in one hour's rowing. Oranienbaum is only 23 versts W. of Petersburg. In winter there is a common carriage road from Petersburg to Cronstadt on the ice, down the river Neva in a direct line over the gulf of Cronstadt, marked out with fir branches, and by the side of it are several guard-houses and a half-way or baiting booth. "Tooke's View of the Russian Empire." "Storch's Picture of St. Petersburg."—Also, a handsome and populous town of Austria, in Transylvania, near the frontiers of Moldavia, 60 miles E. of Hermannstadt, and next in rank to that place. It has three large suburbs, and was anciently called *Brassau*, *Brasso*, *Brassovia*.—Also, a castle in Sweden, erected in the year 1710, near the small town of Frosan in the southern part of the province of Jamtland.

CRONSTADT, *the gulf of*, is that part of the gulf of Finland in the Baltic sea which stretches from the island and town of Cronstadt to the mouth of the river Neva, or rather to St. Petersburg itself. See the preceding article.

CRONSTEDT, AXEL FREDERICK, in *Biography*, a celebrated mineralogist, was born at Sudermania in 1722. From a very early period he shewed a great attachment to the studies of natural history; and as he advanced in life he received several appointments from the government of Sweden, connected with the mines of that country. In 1753 he was elected a member of the royal academy of sciences at

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Stockholm; and in 1755 made a tour to Norway, to inspect the mines there. The greater part of his life was spent among the mines, the management of which fell chiefly on him. He died Aug. 1765. His principal work was entitled "An attempt towards an Arrangement of Minerals, or of the different Substances of the Mineral Kingdom." He published many papers on metallurgy, economy, &c. He was the first scientific writer on mineralogy, and was the inventor of most of those terms which have been since applied to the distinction of the external characters of mineral bodies. Gen. Biog.

CROOK, in *Rural Economy*, a term often provincially employed to signify a sort of strong iron hook, such as is in use for hanging field and other gates with. It is also sometimes applied to the crooked staff formerly made use of by the shepherd.

CROOKS, a name applied in some districts, as Devonshire, to a sort of pack-horse furniture, by which various articles of the farm kind are conveyed on the back of the horse. It is a sort of contrivance which, according to the author of the rural economy of the above county, varies with the nature of the load.

And it is remarked by the same writer that "hay, corn, straw, faggots, and other comparatively light articles of burden, are loaded between "crooks" formed of willow poles about the thickness of scythe-handles, and seven or eight feet long, bent as ox-bows, but with one end much longer than the other. These are joined in pairs with light cross-bars, eighteen inches to two feet long; and each horse is furnished with two pair of these crooks, slung together, so as that the shorter and stronger ends shall lie easy and firmly against the pack-saddle; the longer and lighter ends rising, perhaps, fifteen or more inches above the horse's back, and standing four or five inches from each other. Within and between these crooks the load is piled, and bound fast together, with that simplicity and dispatch which long practice seldom fails of striking out.

"Cord-wood, large stones, and other heavy articles, are carried between short crooks, made of four natural bends or knees, both ends being nearly of the same length; and in use the points standing nearly level with the ridge of the pack-saddle.

"Dung, sand, materials of buildings, roads, &c. are carried in "pots," or strong coarse panniers, slung together like the crooks; and, as panniers are usually slung, the dung, especially if long and light, being ridged up over the saddle.

"The bottom of each pot is a falling door, on a strong and simple construction. The place of delivery, being reached, the trap is unlatched, and the load released."

These are rude methods of conveying such sorts of materials which have continued in use long after the causes which introduced them have ceased to exist; better modes are now beginning to be practised.

CROOKS, are short tubes of brass of different lengths, adapted to fit into the upper end of the tubes of French-horns, trumpets, and trombones, and into their mouth-pieces, by which the instrument is lengthened or shortened at pleasure, in order to tune it to the pitch of the organ, or other instrument, with which it is to be used in concert, or for adapting it to perform in different keys.

CROOKED HAVEN, in *Geography*, a bay of Scotland, on the N. coast of the county of Banff, $2\frac{1}{2}$ miles N.W. of Cullen.

CROOKED Island, one of the Bahama islands, in the West Indies. In this island is a singular excavation of the rocks, resembling a dilapidated structure, and formed by the violent agitation and continued action of the breakers from the sea.

For a minute description we refer to McKinnen's West Indies, p. 21.

CROOKED Lake, a lake of America, in the Genessee country, communicating in an E. by N. direction with Seneca lake.—Also, one of the small chain of lakes which connects the lake of the Woods with lake Superior, on the boundary line between the United States and Upper Canada, remarkable for its rugged cliffs, in the cracks of which are a number of arrows sticking.

CROOKED River, a river of America, in the state of Georgia, and county of Camden, which discharges itself into the sea opposite to Cumberland island, 12 or 14 miles N. from the mouth of St. Mary's. Its banks are well timbered, and its course is E. by N.

CROOKEDNESS. See DISTORTION.

CROOKHAVEN, in *Geography*, a small town, or rather village, of the county of Cork, Ireland, on a harbour of the same name. It is at the western extremity of the county, a few miles N.W. from Cape Clear. The harbour is narrow, but all good ground, well-sheltered, and has water sufficient for large ships. It is a commodious place for vessels bound to the eastward. It is about 180 Irish miles S.W. from Dublin, and 3 east from Mizen-Head. N. lat. $51^{\circ} 25'$. W. long. $9^{\circ} 38'$. McKenzie.

CROOKKNEL, in *Mineralogy*, a miner's term in Derbyshire, for a belly or wide place of ore in a vein. See LUM, KIDNEY, NEST.

CROOM, in *Geography*, a small post-town of the county of Limerick, Ireland, on the river Maig, 142 miles S.W. from Dublin, and 10 S. from Limerick.

CROONE, WILLIAM, in *Biography*, a native of London, received his education at Emanuel college at Cambridge, of which he was admitted a fellow in the year 1654. His inclination leading to the practice of medicine, he soon after settled in London. In 1659 he was chosen rhetoric professor of Gresham college, and the following year register of the royal society, which held their meetings there. In 1662, he was created doctor in medicine, by mandate of the king, and the same year he was elected a fellow of the royal society, and of the college of physicians. In 1670 he was appointed lecturer in anatomy to the company of surgeons, in the place and on the recommendation of sir Charles Scarborough. Dr. Croone had travelled some years over France, and other parts of Europe, and kept up a correspondence with many of the foreign literati. On his death, which happened on the 12th of October 1684, he left one hundred pounds to the company of surgeons. His books on medicine he gave to the college of physicians, those treating on mathematics to Emanuel college, to which college, and to six other colleges, he left the sum of 20*l.* annually to each of them, to found lectures in mathematics, and to the college of physicians, and to the royal society, the profits to be derived from a house in Old Fish-street, the King's-head tavern, for lectures to be read annually before those learned bodies, on muscular motion. The only publication by Dr. Croone is a small tract, "De ratione motus musculorum," printed in London, 1664, 4*to.*, though several papers were left on philosophical subjects. Ward's Professors of Gresham college.

CROOTES, in *Mineralogy*, a substance found about the ore in the lead-mines at Meudip, being a mealy, white, soft stone, matted with ore.

CROP, in *Agriculture*, a term signifying the quantity or produce of any sort of field crop, as of grain, pulse, roots, plants, grass, or any similar kinds, raised by the farmer on any portion of ground at one time. And from this diversity, they are likewise further distinguished into corn, root, and green crops, according to the circumstances of the case.

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The culture and utility of the two last sorts have been greatly increased within these last few years, in consequence of their application, as cattle food, being more perfectly understood. It is indeed to this circumstance that much of the modern improvement in husbandry is owing, and from which a great deal of the increased profit of the farmer has been derived.

The nature of the different sorts of crops, and the methods of distributing them on different sorts of farms, will be fully considered in speaking of the courses of crops. See *CROPS, Course of*.

CROP, in *Gardening*, a term denoting the produce or kind of any sort of vegetable, plant, fruit, seed, or root, which is raised or cultivated upon any bed, border, or other compartment of the kitchen garden. They are distinguished in many different ways, as into autumnal, winter, and spring crops, into early and late crops, and into seed or root crops, generally, as well as small seed crops. And there are likewise various sorts of fruit crops, both of large and small kinds, as well as various descriptions of forcing or frame crops. The proper management of these different kinds of crops constitutes a principal part of the art of gardening.

CROP, in *Mining*, denotes the upper part or covering of a stratum; thus, the roof of a coal-mine is sometimes called its crop.

CROPALATE, in *Geography*, a town of Naples, in the province of Calabria, 11 miles S.E. of Rossano.

CROPANI, a town of Naples, in the province of Calabria Ultra: 9 miles E.N.E. of St. Severina.

CROPASSIA, a town of Naples, in the province of Calabria Citra: 7 miles W. of Umbriatico.

CROPERDY, a village in Oxfordshire, in the hundred of Banbury, 3 miles N. of Banbury, and 7 S N.W. of London; is situate on the Charwell river, and on the line of the Oxford canal, at a place where it was once proposed that the Stratford and Croperdy canal should join this. (See *CANAL*.) In the year 1644, a battle was fought here between the forces of the king and those of the parliament, in which the latter were defeated.

CROPHI, in *Ancient Geography*, a mountain of Egypt, between Elephantina and Syené. The sources of the Nile, according to Herodotus, were between this mountain and that of Mophi.

CROPPER, or *Dutch Cropper*, in *Ornithology*, the name of a particular species of pigeon, called the *columba gutturosa Bataviae*, by Moore: the *gutturosa*, a variety of the *COLUMBA DOMESTICA*, which see. It is naturally thick, and has its name from its large crop, or bag of wind, which it carries under its beak, and can at pleasure either raise or depress. These are thick bodied, and short; their legs are also thick and short, and are feathered down to the feet; the crop is large and hangs low; the feathers on the thighs hang loose; and their legs stand wide; they are gravel-eyed, and are generally very bad feeders.

There are of these pigeons of all colours, and those who are careful of them, generally take them away from their proper parent, while young, and breed them under the females of other species.

CROPS, Course of, in *Agriculture*, denotes the means or methods of adapting and sowing them in such a manner to the particular nature of the land or soil, as that they may render it the most abundant and productive, with the least possible degree of deterioration or exhaustion of its fertile properties. It has been well observed by a late writer that "the proper cropping of arable land is a matter of the utmost importance to the interests of the farmer, as upon it in a great measure must depend the profits and advantages

which he is to derive from his labour and industry." It is conceived by Mr. Billingsley, an experienced agriculturalist in the western part of the kingdom, to be "the most prominent feature in good farming, and that by which the produce of the soil may be increased in a threefold proportion: and by another writer in a more southern district, as one of the most important subjects that can occupy the attention or exercise the ingenuity and skill of the agriculturalist." And Mr. Young, in his valuable calendar of husbandry, conceives it to be the most important subject that has been treated of by the modern writers of husbandry, and that on which they have thrown far more light than upon any other circumstance in agriculture. It is a very singular and remarkable circumstance, he says, that before the reign of his present majesty, notwithstanding the multitude of books on agriculture, there is not one author who had any tolerable ideas upon this subject, or even annexed to it any importance. They recite, he observes, courses good, bad, and execrable in the same tone, as matters not open to praise or censure, and unconnected with any principles that could throw light on the arrangement of field-crops. But that "when once the idea was properly started, its importance, continues he, presently became obvious, so that thirty years have carried to great perfection the precepts which practice has afforded in this branch of rural economy."

And that it demands much regard by the cultivator is fully evinced, says a late writer, by the great advantages that have been gained by it since its principles have become more perfectly understood and more extensively applied. It has indeed been well remarked by the editor of the "Annals of Agriculture," that "wherever either very good or very bad husbandry is found on arable land, it results more from the right or wrong arrangement of the crops than from any other circumstance." And that "no district is well cultivated under bad rotations, while it is exceedingly rare to see any badly managed under good ones."

It may be observed farther that, in the arrangement of this business, as different sorts of plants or crops not only require different kinds and proportions of nutritious materials to be drawn from the earth for their increase and perfect growth, but also different situations and conditions of soil, it must be necessary to adapt them as much as possible to the peculiar qualities of the soil, as well as the state of the land, and the nature of the climate, in which it is placed; and as on the same principles some sorts of crops may exhaust or deteriorate the soils on which they grow, in much less proportions than others, which is well known to be the case with many kinds of what are termed *green crops*, when compared with those of the *wheat* or *corn* kind; it will be requisite to alternate or interpose them in such a manner as that the ground may sustain the least possible injury in that way. In addition to the above observations and directions; it may likewise be of great utility to attend to other circumstances, as those of introducing such sorts of green crops as are most suited by the shade of their leaves and the kind of culture which they require while growing, for keeping the ground clean from weeds, and in a mellow and suitable state for the reception of the more valuable kinds of grain crops, as in this way the necessity of having recourse to the uneconomical process of fallowing, may be considerably lessened, if not wholly obviated. It has been shewn by experience that all the culmiferous class of plants injure the soil in a very high degree, which probably depends upon their having but few, and those small leaves; consequently being necessitated to draw their nourishment chiefly from the soil at all periods of their growth, but especially during the time of their maturing their seeds, when, from the dry withered state of their

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their leaves, it is impossible that any thing can be drawn from the atmosphere. But they may be prejudicial in other ways, the seeds of their plants ripening all at the same time; on their beginning to ripen the plants become stationary, the roots ceasing to push or penetrate into the ground, and of course to move or loosen it; and the withered leaves and sapless stems being cut down, leave the land fully exposed to the action of the sun and winds, by which it becomes dry, hard, and compact, being greatly exhausted by the dissipation of its moisture and other properties, while opportunities are given for its being filled with weeds before the winter sets in. Of all the various sorts of this class of plants, wheat, from its being the heaviest in its grain, is probably the most deteriorating in its effects on the soil, while the difference between barley and oats is but trifling in this respect; and rye is well known to be less prejudicial in this way than any of the other kinds.

In regard to the green, or what are frequently termed leguminous crops, and those of the root kind, it may be remarked that the former, from their seeds being formed in a successive manner, their flowers, with green and ripe fruit presenting themselves at the same time on different parts of the same plant, they continue, of course, in a state of growth, pushing their numerous fibrous or other roots deeply into the ground, while at the same time they derive much of their nourishment from the surrounding air, by means of their green leaves, till the very period at which they are cut down. It is probably on this account that the straw of some of the plants of this class is so much superior to that of the grain kind, as well as the great difference in the state and condition of the land, the leguminous plants keeping the mould not only loose, friable, and mellow for the plough in the way noticed above, but by their close thick shade, they preserve the moisture in the land in an effectual manner, and produce a fermentative process, by which means the vegetable matters which are covered, are speedily reduced, and the soil left in a rich, moist friable state.

Red or broad clover is very beneficial in this way, and when cut readily shoots again, keeping the soil loose by its deep tap root, and when ultimately turned in, affords a large portion of vegetable matter to the soil; and besides it admits wheat to be sown on a single furrow, by which the great labour and expence of summer fallow is saved. This probably deserves the first place as an ameliorating plant in cropping land.

And tares or vetches are in general considered as deserving the next place in the scale of improving crops. They have much similarity to the pea and bean in their habits of growth, but of less size. There are different varieties or sorts of them, which serve the purpose of green cattle food at different seasons of the year, but in some cases are made into hay in the summer kind. They consequently contribute largely in this way, as well as by the closeness of the shade which they afford, and the preservation of moisture to improve the soil.

Pease, when cultivated for the purpose of being cut green, as fodder, have similar effects to those of vetches in meliorating the soil as well as most of the properties of clover upon it. But when they are suffered to ripen their seed, they become exhausting in a high degree, perhaps not very much less than grain.

The bean plant is found highly beneficial on the more stiff, heavy, clayey soils, as bringing such sorts of land into a state of preparation for wheat; but though, like other plants of the same class, they exhaust little, they do not shade the ground so perfectly as the crops which have been just mentioned, consequently do not preserve the moisture so com-

pletely. Besides, from their being mostly suffered to ripen their seeds, they require manure. They are in general found more useful in breaking down and reducing stubborn soils, and preventing the growth of weeds, than in improving the land on which they are raised.

Turnips and cabbages are plants which afford considerable shade by the number and size of their leaves, and their roots penetrate to some depth in the soil. By the preparation of the ground, and the after culture which they require, the land is also rendered fine, and kept free from weeds, by which it becomes in excellent condition for barley. When not consumed upon the ground, some deterioration is probably produced by them, as they require rich soils and manure, to raise them with success. They are, however, crops which afford large supplies of food for cattle stock in the latter part of the autumn, the winter, and the early spring.

The culture of the potatoe is had recourse to with similar intentions in reducing the soils which, from the nature and size of the root, is perhaps performed with more effect, and of course renders them in excellent order for barley, which is usually found to succeed better after them than wheat. They cause great closeness and shade by which the moisture of the land is well preserved; but from the nature and size of the roots, they are found to exhaust the ground in an equal degree even to wheat crops, and they require a large supply of manure.

Where the soils are suitable the carrot and parsnip may be grown with vast advantage, as affording an abundant supply of the most nutritious sorts of food for domestic animals. From the nature of their top roots and their size, they prepare the land well for the crops which are to follow them. Under these crops, and those of clover, tares, cabbages, and potatoes, the same quantity of land has been found to produce twice as much cattle food as when in the state of grass. There are several other plants that may be introduced in the courses of cropping, under particular circumstances with much propriety and advantage, but it is not necessary to notice them here.

It has been remarked by Mr. Middleton, in his Agricultural Report of Middlesex, in speaking of green crops as a substitute for fallows, that "the aggregate benefits that may be derived to the country from this measure are not to be estimated, but among the first of these will stand the abolition of fallows, and the introduction of green crops to supply their place over an extent of about three millions of acres of arable land, which have hitherto under the fallow system, produced nothing useful during the fallow year." Further that, "so far as tares and turnips or potatoes, or pease and turnips, or potatoes, or any two good crops, can be raised in one year, in place of a fallow, the produce will be double in quantity what it has been under the former system." And he adds that "there are about nine millions of acres in England and Wales in the course of two crops and a fallow; that is, six in crop and three in fallow. Hence it follows that by procuring one crop in lieu of the fallow, fifty per cent. is added to the former produce. But so far as two crops can be obtained in place of a fallow, it adds 100 per cent., or double the former number of acres of produce."

And that "as most sorts of soils when continued for any great length of time either under grain or grass are liable, it is remarked by another writer on this subject, to fall in injury, and become less capable of producing full crops; in the first case, probably from the carbonaceous principle being too greatly exhausted, and in the latter from the occurrence of mofs or other noxious vegetable productions that establish themselves in consequence of the weak and imperfect growth of the grass plants; it may be proper to occasionally alter and change

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change the nature of their crops by keeping them for a while after being broken up from grafs under the plough, and then restoring them again to the state of grafs, as in this way the deficient principles may probably be the most readily supplied where manure in sufficient quantities cannot be procured, and the injurious vegetable products be the most effectually removed." And it is further necessary "to be constantly kept in view in directing the modes of cropping lands that such an intermixture of green root, pea, bean, and grain crops be grown, as will not only be best adapted to keep the soil in the most perfect order, but suit the demands of the cultivator, for the purposes of sale as well as the keeping of such numbers of different sorts of live-stock, as may be proportionate to the supplying of those quantities of manure that may be requisite for the preserving the farm in the most perfect condition, or state of heart."

It is likewise stated by the author of "Practical Agriculture" that, "in regulating the courses of crops on all descriptions of land with the view of preventing their exhausting the soil, it will be necessary to guard against the occurrence of grain, potatoe, or other crops of a similar kind, in succession, as the result of experiments attentively made, as well as the experience of the most correct agricultors in different districts have decidedly shewn their effects to be very powerful when employed in such a manner, in deteriorating and lessening the productive powers of the ground."

In the trials of Mr. Arthur Young, in respect to the effects of different sorts of crops on land, "which appear to have been conducted with a considerable degree of accuracy and attention, on a soil of the sandy loam kind, incumbent on a wet clay marle bottom, rendered dry by means of previous hollow draining, and of the annual value of about fifteen shillings the acre, broken up from the state of grafs under which it had been for a great length of time, and ploughed into ridges in contrary directions each succeeding year, no manure being applied except on particular lands or ridges in the fourth, though two or three white crops in succession were found to exhaust in a high degree, potatoes had a still greater effect in the same way, much more than barley in most cases, and in some courses even more than wheat." These experiments are fully recorded in the twenty third volume of the Annals of Agriculture; and more concisely below.

And it is added, that, "the results are equally curious and interesting, as they not only demonstrate the advantages that may arise from the alternation of different sorts of crops in different ways, but the effects of various rotations, both good and bad, upon the soil and produce derived from it. They would, however, it is observed, have been more satisfactory, if the nature of the land had admitted the turnip and cabbage crops to have been consumed upon the ground, as no certain conclusions can probably be drawn where this is not the case; for though a proportionate quantity of manure may be afterwards returned to the land, its application in that way does not seem to afford such beneficial effects as when gradually incorporated with the soil during the time the animals are feeding on it, upon such luxuriant vegetable substances. Besides the effects of the urine and perspiration, which are known to be of considerable utility in ameliorating the earth, are wholly lost." It is further suggested by this able writer, that tares, clover, and other grasses of the artificial kinds, should likewise have been introduced, as by such kinds of crops, the courses would not only have been more varied, but the effects of different combinations more fully shewn.

And the able experimenter further remarks, that, "all the work of tillage was performed by the common imple-

ments of the farm, and that the crops in the whole of the thirty-six courses were reaped and threshed directly, distinct from each other, to obviate the danger of mixing and errors, and that they are numbered accurately to save the trouble of calculation. In the valuation all the straw is rated at 10s. an acre, and the crops are likewise estimated, that the fluctuations of price may not affect the general conclusions; the turnips at 4s. a ton carted off, cabbages at 5s., wheat 5s. a bushel, barley 2s. 6d., oats 2s. 3d., beans 3s., potatoes 6d., any other value may however, he says, be put upon them according to circumstances."

It is, however, added that, in order to afford a full and complete view of the effects of different courses of crops, it would be necessary to compare them on soils of different qualities, and which vary much in respect to their nature, climate, situation, and other circumstances. But even as they stand, the intelligent farmer may draw many useful deductions from them.

COURSE I.		
<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs. 1 bushel	4 5 0
2 Turnips	8 tons 0 cwt.	1 13 0
3 Wheat	2 qrs 5 bushels	5 15 0
4 Potatoes	234 bushels	5 17 0
5 Beans	3 qrs.	4 2 0
6 Wheat	3 qrs. 3 bushels	7 5 0
		28 17 0
	<i>Per annum</i>	4 16 2

COURSE II.		
<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs. 1 peck	4 2 9
2 Cabbages	6½ tons	1 12 6
3 Wheat	2 qrs. 5 bushels	5 15 0
4 Cabbages	7 tons	1 15 0
5 Beans	3 qrs. 7 bushels	5 3 0
6 Wheat	3 qrs. 3 bushels	7 5 0
		25 13 3
	<i>Per annum</i>	4 5 ½

COURSE III.		
<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs. 1 bushel, 1 peck	4 5 9
2 Potatoes	150 bushels	3 15 0
3 Wheat	2 qrs. 2½ bushels	5 2 6
4 Cabbages	5½ tons	1 7 6
5 Beans	3 qrs. 5 bushels	4 17 0
6 Wheat	3 qrs. 1 bushel	6 15 0
		26 2 9
	<i>Per annum</i>	4 7 1½

Upon these courses it is remarked, that their effects lead to different conclusions: in the first course, in which there are four green fallow crops, to two of the white or grain kind, little advantage is shewn except in the leaving of the

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the land in fine tilth, and perfectly clean. Nothing of superiority is shewn by the quantities of produce for lands newly broken up. But it is observed, that the turnips, by being drawn and removed from the land, were not favourable, as wheat or turnip ground is not generally good, except well trodden by feeding. Potatoes appear to exhaust, and the experimenter suggests that estimating thirty tons of yard compost, the proportion employed at any imaginable rate, the course cannot be advisable; the loss on the potatoe crop, would not, he thinks, be less than five pounds, nor would the turnips pay so as to leave a profit equal to the expences of newly broken up lands for the first six years.

He however states the second as a more profitable course from the great charge of the potatoes not being incurred, and it shews that though cabbages cannot be grown to any great advantage on such soils, without manure, they may be of much utility by the pulverization and cleanness which they afford. The goodness of the grain crops, evinces, it is supposed, that they exhaust but little, and that it is of great importance to have few white crops in rotations. And the third he considers as explaining the necessity of manuring for potatoes on all soils except such as are rich and dry. With only two white crops in six years, the land seems rather, it is observed, to improve, notwithstanding the potatoe crop. The goodness of the last crop of wheat, in comparison with the first, proves, he says, the superiority of cabbage and bean crops, over those of beans and potatoes, in cleaning and rendering the ground fine and fit for the growth of wheat crops, in a perfect manner.

COURSE IV.

Course.	Produce.	Value.		
		£.	s.	d.
1 Beans	3 qrs. 1½ bushel	4	5	9
2 Beans	4 qrs. 2 bushels	5	12	0
3 Wheat	2 qrs. 3½ bushels	5	7	6
4 Cabbages	6½ tons	1	12	6
5 Beans	4 qrs.	5	6	0
6 Wheat	3 qrs. 1 bushel	6	15	0
		<hr/>		
		28	18	9
		<hr/>		
Per annum		4	16	6½

COURSE V.

Course.	Produce.	Value.		
		£.	s.	d.
1 Beans	3 qrs. 2 bushels	4	8	0
2 Barley	3 qrs. 1 peck	3	10	7
3 Wheat	2 qrs. 2 bushels	5	0	0
4 Barley	2 qrs. 2 pecks	2	11	5
5 Beans	2 qrs.	2	18	0
6 Wheat	1 qr. 7 bushels	4	5	0
		<hr/>		
		22	13	0
		<hr/>		
Per annum		3	15	6

COURSE VI.

Course.	Produce.	Value.		
		£.	s.	d.
1 Beans	3 qrs. 1 bushel, 1½ peck	4	5	5
2 Wheat	2 qrs. 7 bushels	6	3	0
		<hr/>		
Carry over		10	8	5

Brought forward

3 Wheat	1 qr. 6 bushels	-	-	4	0	0
4 Wheat	2 qrs.	-	-	5	2	6
5 Beans	1 qr. 7 bushels	-	-	2	15	0
6 Wheat	1 qr. 4 bushels	-	-	3	10	0
				<hr/>		
				25	15	11
				<hr/>		
Per annum				4	6	0

The experimenter says, that the results of these courses shew, in the first, the utility of repeated bean crops in cleaning land; and, when combined with cabbages, in preserving the fertility of such as is newly broken up. When compared with the first course, which ends in the same way, its advantages also appears, he thinks, great in different other respects. By the two last, the disadvantages attending successive crops of corn are particularly brought forward. And it is well remarked, that they also shew that any sort of corn crops will succeed, to a certain extent, on lands recently broken up, from the state of old grass or sward; and that, for the first two or three years, they may afford a produce proportionate to the sort of crop that is sown or cultivated on them. But that the three last years, on being compared with the three first, the whole still in corn, the product was in the ratio of 9*l.* 14*s.* 5*d.* to 14*l.* 18*s.* 7*d.* or a decrease of more than 5*l.* While, in the preceding courses, with better rotations, the products have somewhat increased. The difference, he says, is therefore enormous. The decline in the barley, and even the wheat crops, notwithstanding the intervention of beans in the latter case, is very great. Besides, they leave the land in a bad condition, being in the fourth and sixth years such a bed of weeds, as could not be half destroyed by the hoeing of the beans. In these instances, the land not being left worth eleven shillings an acre, while in some of the preceding it was left of the value of sixteen. These, he well remarks, are the prejudicial effects of adopting bad courses of cropping, from the circumstances of old grass lands being capable of affording a good produce for a time. The same consequences may, likewise, he thinks, take place, even upon soils of a much better quality by such methods of cropping. It is evident that they should, therefore, be avoided as much as possible on all descriptions of soil by the correct farmer. The last of these courses not only exhibits the badness of the practice of taking successive grain crops, but that beans, by the aid of the hoeing culture, cannot afford a produce, even on newly broken up land, that will sufficiently repay the great trouble and expence of the farmer.

COURSE VII.

Course.	Produce.	Value.		
		£.	s.	d.
1 Beans	3 qrs.	4	2	0
2 Turnips	4 tons	0	16	0
3 Beans	5 qrs. 2 bushels	6	16	0
4 Potatoes	2,34 bushels	5	17	0
5 Beans	3 qrs.	4	2	0
6 Wheat	3 qrs. 4 bushels	7	10	0
		<hr/>		
		29	3	0
		<hr/>		
Per annum		4	17	6

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COURSE VIII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs. 1 bushel	4 5 0
2 Cabbages	6 tons	1 10 0
3 Beans	3 qrs.	6 10 0
4 Cabbages	6½ tons	1 12 6
5 Beans	4 qrs. 2 bushels	5 12 0
6 Wheat	3 qrs. 6 bushels	8 0 0
		27 9 6
<i>Per annum</i>		4 11 7

COURSE IX.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs.	4 2 0
2 Potatoes	147 bushels	3 13 0
3 Beans	4 qrs.	5 6 0
4 Cabbages	6½ tons	1 12 6
5 Beans	4 qrs. 2 bushels	5 15 0
6 Wheat	3 qrs. 5 bushels	7 15 0
		28 0 6
<i>Per annum</i>		4 13 5

COURSE XI.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs. 7 pecks	4 2 9
2 Barley	4 qrs. 7 bushels	5 7 6
3 Beans	4 qrs.	5 6 0
4 Barley	5 qrs. 4 bushels	7 0 0
5 Beans	4 qrs. 1 bushel	5 9 0
6 Wheat	3 qrs. 1 bushel	6 15 0
		34 0 3
<i>Per annum</i>		5 13 4

COURSE XII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs.	4 2 0
2 Wheat	2 qrs. 6½ bushels	6 2 6
3 Beans	3 qrs. 2½ bushels	4 9 6
4 Wheat	3 qrs. 3¾ bushels	7 8 9
5 Beans	3 qrs.	4 2 0
6 Wheat	3 qrs.	6 10 0
		32 14 9
<i>Per annum</i>		5 9 1

On these courses, it is noticed, that the produce of the first of them, though there is only one grain crop in the six years, is so considerable, as to prove the disadvantage of deteriorating courses, especially as the circumstances under which they are put in are supposed by some to be unfavourable, on account of the land, after turnips and potatoes, from the repeated tillage which is required for such crops, being left in too light and porous a state for the growth of beans. It has the advantage, however, of leaving the land perfectly clean, and in a fertile condition. And likewise proves, in the opinion of the experimenter, that great attention may be had to the keeping of land clean and in heart, by gentle modes of cropping, without the danger of immediate injury being sustained by it. And it is further supposed, that, if beans or wheat had been the crop of the fourth year upon the manure, in place of the potatoes, the profit, on the whole, would have been more, without the ground being left in a less rich condition. In regard to the two last courses, they show, from there being but one grain crop in six years, that though cabbages, by being removed from the land, exhaust, three crops of beans are sufficient to preserve the land for a good wheat crop, besides leaving it in a good situation. They are, consequently, profitable courses, and such as are suited to the obtaining of perfect cleanness of culture. In the latter course, the profit is, however, less, from the circumstance of potatoes being had recourse to as a crop.

COURSE X.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Beans	3 qrs.	4 2 0
2 Beans	4 qrs.	5 6 0
3 Beans	4 qrs. 6 bushels	6 4 0
4 Cabbages	8½ tons	2 2 6
5 Beans	4 qrs.	5 6 0
6 Wheat	4 qrs. 1 bushel	8 15 0
		31 15 6
<i>Per annum</i>		5 5 11

The experimenter on these courses suggests, that it is evident, from the first, that successive crops of beans have a considerable ameliorating property, as both the cabbages and beans after them were very good. Their effects in preserving the fertility arising from the old turf is likewise obvious, as well as that of keeping the land perfectly free from weeds, at the same time that a good profit is afforded. It also, he supposes, affords a strong proof of the advantage of a careful method of cropping newly broken up lands. Such courses should, consequently, he says, be more frequently employed on all those stiff and retentive descriptions of land on which beans can be grown, both with the view of immediate profit, and the benefits that may ensue from the land being kept clear and free from noxious weeds.

In respect to the second, it affords, in his opinion, an example of a good and correct mode of practice, without much exhaustion: though, if compared with the preceding course, there appears to be, he says, a slight degree of deterioration from the wheat, in that being a quarter more. It may, however, be adopted as a very profitable course. The last of these courses is well known to be a very profitable one on all the richer sorts of heavy soils; and it is here shewn, he thinks, to answer well on such as are of an inferior quality, even without the application of manure. The power of bean crops, in preserving the fertility of lands newly broken up from sward, is likewise here evinced by the sixth crop, though inferior to others. This course should not, however, in general, he thinks, be attempted, except on the richest sort of heavy-soiled kinds of land.

COURSE XIII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	3 tons	0 12 0
2 Turnips	5½ tons	1 2 0
<i>Carry over</i>		1 14 0

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		£. s. d.
Brought forward		1 4 0
3 Oats	9 qrs.	8 12 0
4 Potatoes	252 bushels	6 6 0
5 Beans	3 qrs. 1 bushel	4 5 0
6 Wheat	3 qrs. 3 bushels	7 5 0
		28 2 0
<i>Per annum</i>		4 13 8

COURSE XIV.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	3 tons	0 12 0
2 Cabbages	6 tons	1 10 0
3 Oats	10 qrs. 5½ bushels	10 2 4
4 Cabbages	8 tons	2 0 0
5 Beans	3 qrs. 5 bushels	5 17 0
6 Wheat	3 qrs.	6 10 0
		26 11 4
<i>Per annum</i>		4 8 6

COURSE XV.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	3½ tons	0 14 0
2 Potatoes	154 bushels	3 17 0
3 Oats	8 qrs. 5½ bushels	8 1 11
4 Cabbages	8 tons	2 0 0
5 Beans	3 qrs. 5 bushels	4 17 0
6 Wheat	3 qrs. 1 bushel	6 15 0
		26 4 11
<i>Per annum</i>		4 7 6

The experimenter remarks on these courses, that the first exhibits the utility of repeated turnip crops in the preparation of this kind of soil for grain crops, the produce of the oats from the pulverization they effected being very great. It is added, that oats are molly sown on newly broken up-lands, but never with much success on such as are wet. The exhaustion of the soil in this course seems not to have been great; though the oats were followed by potatoes, which are known to exhaust, as the succeeding bean and wheat crops were both good, but more especially the latter. It is obvious, however, he says, that as turnips and cabbages cannot be produced to advantage on such cold, wet soils, without much manure; that such rotations must be the most beneficial and proper on the drier sorts of land, where such crops can be grown and fed on the grounds by live stock. And, he adds, that the gross product in the second course is not to be compared with the first, as the potatoes affording six guineas left no profit. The largeness of the produce of oats seems to shew, he says, the beneficial effects of cabbage crops in preparing the soil. The inferiority of the wheat crop, when compared with that in the first of these courses, is supposed to depend on the want of manure. Notwithstanding there are two crops of cabbages and one of turnips in this course, it appears, he says, to be

profitable. It would seem, however, to be the most suited to the more dry kinds of soil.

He states farther, that in comparing the third course with the two that precede it, the deteriorating properties of potatoes are evidently much greater than those of either turnips or cabbages, from the inferiority of the oat crop that followed them. And it is suggested that, "wherever potatoes enter with a small produce, the expenses more than absorb the value."

COURSE XVI.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	3 tons	0 12 0
2 Beans	4 qrs.	5 6 0
3 Oats	8 qrs. 7 bushels	8 9 9
4 Cabbages	6 tons	1 10 0
5 Beans	3 qrs. 6 bushels	5 0 0
6 Wheat	3 qrs. 2 bushels	7 0 0
		27 17 9
<i>Per annum</i>		4 12 11

COURSE XVII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	5½ tons	0 14 0
2 Barley	5 qrs. 1 peck	5 0 7
3 Oats	5 qrs. 5 bushels	5 11 3
4 Barley	4 qrs.	4 10 0
5 Beans	3 qrs.	4 2 0
6 Wheat	2 qrs.	4 10 0
		24 7 10
<i>Per annum</i>		4 1 3

COURSE XVIII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>
		£. s. d.
1 Turnips	3 tons	0 12 0
2 Wheat	2 qrs. 7 bushels	6 5 0
3 Oats	4 qrs. 6½ bushels	4 16 1
4 Wheat	2 qrs. 3 bushels ½ peck	5 5 4
5 Beans	2 qrs.	2 18 0
6 Wheat	1 qr. 7 bushels	4 5 0
		24 1 5
<i>Per annum</i>		4 0 2

On these courses he hints that the result of the first displays the advantage of beans over potatoes in respect to profit. In the second, the land being left foul and in a bad condition, shews by the lightness of the wheat crop, when compared with those in other courses, that great deterioration had been produced by it. The last course exhibits a still worse practice, and that the land is left in a more deteriorated and foul situation by three wheat crops. Such courses can of course never be had recourse to with either the view of profit, or that of keeping the land in proper condition in respect to cleanness.

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COURSE XIX.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	106 buſhels - -	2 13 0
2 Turnips	4½ tons - -	0 18 0
3 Potatoes	136 buſhels - -	3 8 0
4 Ditto	198 buſhels - -	4 19 0
5 Beans	2 qrs. - -	2 18 0
6 Wheat	1 qr. 6 buſhels	4 0 0
		<hr style="width: 100%;"/>
		18 16 0
	<i>Per annum</i>	<hr style="width: 100%;"/> 3 2 8

COURSE XX.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	185 buſhels - -	2 12 6
2 Cabbages	5 tons - -	1 15 0
3 Potatoes	110 buſhels - -	2 15 0
4 Cabbages	4 tons - -	1 0 0
5 Beans	2 qrs. 2 buſhels	3 4 0
6 Wheat	2 qrs. - -	4 10 0
		<hr style="width: 100%;"/>
		15 6 6
	<i>Per annum</i>	<hr style="width: 100%;"/> 2 11 0

COURSE XXI.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	104 buſhels - -	2 12 0
2 Ditto	126 buſhels - -	3 3 0
3 Ditto	97 ditto - -	2 8 6
4 Cabbages	3 tons - -	0 15 0
5 Beans	1 qr. 7 buſhels	2 15 0
6 Wheat	1 qr. 4 buſhels	3 10 0
		<hr style="width: 100%;"/>
		15 3 6
	<i>Per annum</i>	<hr style="width: 100%;"/> 2 10 7

On theſe courſes it is ſtated, that the deteriorating effects of potatoe crops are fully demonſtrated. With manure in the proportion already explained in the fourth courſe, the beans which ſucceeded were, he ſays, a very poor produce, and the wheat, though the only white crop in ſix years, a miſerable produce in a very good year. He adds, that in the fourth courſe, where there were two crops of wheat, with three of beans, the concluding wheat crop afforded three quarters one buſhel, without any manure, a difference that is highly ſtriking. And that in the eighth, three crops of beans, and two crops of cabbages, were followed with very good wheat, though cabbages removed from the ground exhauiſt; but in theſe courſes there are ſcarcely any except ſucceſſive wheat crops, that exhauiſt the land ſo greatly as potatoe crops are found to do.

With reſpect to the ſecond courſe, it diſplays little elſe, he thinks, but a continued loſs; and the third affords a proof of the loweſt decrease of produce that can be ſuppoſed on newly broken up-land; beſides, the ſoil is left ſo foul and deteriorated, that the whole of its fertility from improve-

ment, and the decay of the old turf, appears removed. It makes ſtrongly, he thinks, againſt potatoes; which can probably only be introduced with advantage as a cleaning crop, and where manure is readily procured, and in great abundance.

COURSE XXII.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	100 buſhels - -	2 10 0
2 Beans	3 quarters - -	4 2 0
3 Potatoes	142 buſhels - -	3 11 0
4 Barley	5 tons - -	1 5 0
5 Beans	2 qrs. 3 buſhels	3 10 0
6 Wheat	2 qrs. 1 buſhel - -	4 15 0
		<hr style="width: 100%;"/>
		19 13 0
	<i>Per annum</i>	<hr style="width: 100%;"/> 3 5 6

COURSE XXIII.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	101 buſhels - -	2 10 6
2 Barley	4 qrs. 7 buſhels - -	5 7 6
3 Potatoes	127 buſhels - -	3 3 6
4 Barley	3 qrs. 2 buſhels - -	3 15 0
5 Beans	2 qrs. 7 buſhels - -	3 19 0
6 Wheat	2 qrs. 5 buſhels - -	5 15 0
		<hr style="width: 100%;"/>
		24 10 6
	<i>Per annum</i>	<hr style="width: 100%;"/> 4 1 9

COURSE XXIV.

<i>Courſe.</i>	<i>Produce.</i>	<i>Value.</i>
		<i>£. s. d.</i>
1 Potatoes	100 buſhels - -	2 10 0
2 Wheat	2 qrs. 1 buſhel - -	4 15 0
3 Potatoes	104 buſhels - -	2 12 0
4 Wheat	2 quarters - -	4 10 0
5 Beans	2 qrs. 2 buſhels - -	3 4 0
6 Wheat	1 qr. 6 buſhels - -	4 0 0
		<hr style="width: 100%;"/>
		21 11 0
	<i>Per annum</i>	<hr style="width: 100%;"/> 3 11 10

The experimenter has remarked, that the firſt of theſe courſes ſhews the exhauiſting effects of potatoes in a ſtill more evident manner; but the effects of the beans are ſomewhat different than in the other caſes noticed above.

It is ſuppoſed evident from the ſecond, that barley ſucceeds better after potatoes than wheat; while the inferiority of the ſecond crop proves that the preparation they afford is not perfectly ſuitable, and that the wheat that ſucceeds is affected by their deteriorating property. The third courſe not only confirms the different reſults that have been ſtated, but affords, by a compariſon with the twelfth, proofs of the utility of having beans and wheat in alternate courſes.

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COURSE XXV.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>		<i>Value.</i>
		<i>£. s. d.</i>		<i>£. s. d.</i>
1 Potatoes	98 bushels - -	2 9 0	3 Cabbages	6½ tons - -
2 Turnips	4 tons - -	0 16 0	4 Cabbages	4 tons - -
3 Cabbages	5½ tons - -	1 7 6	5 Beans	2 qrs. 2 bushels - -
4 Potatoes	270 bushels - -	6 15 0	6 Wheat	2 qrs. 3 bushels - -
5 Beans	2 qrs. 2 bushels - -	3 4 0		<hr/>
6 Wheat	2 qrs. 2 bushels - -	5 0 0		17 11 10
		<hr/>		<hr/>
		19 11 6		<i>Per annum</i> 2 18 7
		<hr/>		<hr/>
		<i>Per annum</i> 3 5 3		

COURSE XXVI.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>		<i>Value.</i>
		<i>£. s. d.</i>		<i>£. s. d.</i>
1 Potatoes	101 bushels - -	2 10 6	1 Potatoes	100 bushels - -
2 Cabbages	6 tons - -	1 10 0	2 Barley	4 qrs. 7½ bushels - -
3 Cabbages	5½ tons - -	1 7 6	3 Cabbages	4 tons - -
4 Cabbages	3 tons - -	0 15 0	4 Barley	4 qrs. 1 bushel - -
5 Beans	2 qrs. 6 bushels - -	3 16 0	5 Beans	3 quarters - -
6 Wheat	2 qrs. 2 bushels - -	5 0 0	6 Wheat	2 qrs. 6 bushels - -
		<hr/>		<hr/>
		14 19 0		23 13 3
		<hr/>		<hr/>
		<i>Per annum</i> 2 9 10		<i>Per annum</i> 3 18 10
		<hr/>		<hr/>

COURSE XXVII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>		<i>Value.</i>
		<i>£. s. d.</i>		<i>£. s. d.</i>
1 Potatoes	100 bushels - -	2 10 0	1 Potatoes	99 bushels - -
2 Potatoes	115 bushels - -	2 17 6	2 Wheat	2 qrs. 7 bushels - -
3 Cabbages	3½ tons - -	0 17 6	3 Cabbages	4½ tons - -
4 Cabbages	3½ tons - -	0 17 6	4 Wheat	3 qrs. 6 bushels 1½ pecks
5 Beans	2 qrs. 2 bushels - -	3 4 0	5 Beans	2 qrs. 6 bushels - -
6 Wheat	2 quarters - -	4 10 0	6 Wheat	2 quarters - -
		<hr/>		<hr/>
		14 16 6		26 5 6
		<hr/>		<hr/>
		<i>Per annum</i> 2 9 5		<i>Per annum</i> 4 7 5
		<hr/>		<hr/>

The writer remarks, that in the first of these courses, though the potatoes of the fourth crop were manured for as above, the poorness of the wheat crop, which was the only one of the grain kind in six years, shews the exhausting effects of cabbage and turnip crops, when removed from the ground in combination with potatoes, to be considerable; and from the second it is evident, that cabbages, when not consumed upon the land, are so prejudicial as not to permit the ameliorating powers of beans to secure a favourable crop of wheat. Neither this nor the preceding course is therefore profitable. The last is stated to be a course of nothing but loss, and which shews, in addition, the exhausting effects of potatoes and cabbages to be great, when removed from the ground to be consumed in other situations.

COURSE XXVIII.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>		<i>Value.</i>
		<i>£. s. d.</i>		<i>£. s. d.</i>
1 Potatoes	96 bushels - -	2 8 0	1 Potatoes	100 bushels - -
2 Beans	3 qrs. ½ peck - -	4 2 4	2 Turnips	4 tons - -
		<hr/>	3 Turnips	5 tons - -
		6 10 4	4 Potatoes	288 bushels - -
		<hr/>	5 Beans	3 quarters - -
		<i>Carried over</i> 6 10 4	6 Wheat	2 qrs. 7 bushels - -
				<hr/>
				21 17 0
				<hr/>
				<i>Per annum</i> 3 12 10
				<hr/>

COURSE XXX.

<i>Course.</i>	<i>Produce.</i>	<i>Value.</i>		<i>Value.</i>
		<i>£. s. d.</i>		<i>£. s. d.</i>
1 Potatoes	100 bushels - -	2 10 0	1 Potatoes	100 bushels - -
2 Turnips	4 tons - -	0 16 0	2 Turnips	4 tons - -
3 Turnips	5 tons - -	1 0 0	3 Turnips	5 tons - -
4 Potatoes	288 bushels - -	7 4 0	4 Potatoes	288 bushels - -
5 Beans	3 quarters - -	4 2 0	5 Beans	3 quarters - -
6 Wheat	2 qrs. 7 bushels - -	6 5 0	6 Wheat	2 qrs. 7 bushels - -
		<hr/>		<hr/>
		21 17 0		21 17 0
		<hr/>		<hr/>
		<i>Per annum</i> 3 12 10		<i>Per annum</i> 3 12 10
		<hr/>		<hr/>

COURSE

C R O P S.

COURSE XXXII.

Course.	Produce.	Value.		
		£.	s.	d.
1 Potatoes	100 bushels	2	10	6
2 Cabbages	5 tons	1	5	0
3 Turnips	4 tons	0	16	0
4 Cabbages	4 tons	1	0	0
5 Beans	3 quarters	4	2	0
6 Wheat	2 qrs. 6 bushels	6	0	0
		<hr/>		
		15	13	6
		<hr/>		
Per annum		2	12	3

COURSE XXXIII.

Course.	Produce.	Value.		
		£.	s.	d.
1 Potatoes	100 bushels	2	10	0
2 Potatoes	112 bushels	2	16	0
3 Turnips	4 tons	0	16	0
4 Cabbages	4½ tons	1	2	6
5 Beans	2 qrs. 5 bushels	3	13	0
6 Wheat	1 qr. 3 bushels	5	5	0
		<hr/>		
		16	2	6
		<hr/>		
Per annum		2	13	9

Here the writer suggests, that the profit of these courses is too trifling to recommend them; and the products of the fifth and sixth years' crops are supposed to be less than they ought to be, from the circumstance of manure being applied in the fourth, and there being only one grain crop in the course: of course, that potatoes, even when manured for, leave the soil in no very advantageous situation for the growth of wheat, though assisted by the cleaning and improving qualities of bean crops.

And that the second and third courses are equally decisive in shewing the exhausting effects both of potatoe and cabbage crops, when not consumed on the land, as well as that they are courses that should seldom be employed, where they cannot be manured for, and be fed off upon the land by live stock.

COURSE XXXIV.

Course.	Produce.	Value.		
		£.	s.	d.
1 Potatoes	98 bushels	2	9	0
2 Beans	3 qrs. 1 peck	4	2	9
3 Turnips	4 tons	0	16	0
4 Cabbages	5½ tons	1	7	6
5 Beans	3 quarters	4	2	0
6 Wheat	2 qrs. 6 bushels	6	0	0
		<hr/>		
		18	17	3
		<hr/>		
Per annum		3	2	10

COURSE XXXV.

Course.	Produce.	Value.		
		£.	s.	d.
1 Potatoes	100 bushels	2	10	0
2 Barley	4 qrs. 6 bushels 3 pecks	5	6	10
		<hr/>		
Carry over		7	16	10

Brought forward

		£. s. d.		
3 Turnips	4 tons	0	16	0
4 Barley	4 quarters	4	10	0
5 Beans	3 quarters	4	2	0
6 Wheat	3 quarters	6	10	0
		<hr/>		
		23	14	10
		<hr/>		
Per annum		3	19	1

COURSE XXXVI.

Course.	Produce.	Value.		
		£.	s.	d.
1 Potatoes	100 bushels	2	10	0
2 Wheat	2 qrs. 6 bushels	6	0	0
3 Turnips	4 tons	0	16	0
4 Wheat	2 qrs. 7 bushels 2½ pecks	6	8	0
5 Beans	2 qrs. 6 bushels	3	16	0
6 Wheat	2 qrs. 6 bushels	6	0	0
		<hr/>		
		25	10	0
		<hr/>		
Per annum		4	5	0

On these three courses it is observed, that the first shews still more fully the effects of potatoes and cabbages. The second also shews, that while the turf of newly broke-up grounds is in a state of decay, spring corn succeeds well after potatoe crops. It likewise proves that three grain crops may be grown in six years, without the soil being greatly exhausted, where proper care and attention is paid to the nature of the crops that are interposed between them in the different courses.

From the numerous facts and observations which have been stated above, we may be enabled to comprehend more clearly the nature and principles of the modern system of cropping land, or the art of properly regulating the courses of crops; by which, long experience has now satisfactorily demonstrated, that ground may be preserved in a tolerable state of heart with a considerably less supply of manure, than under other circumstances; the great expence of the naked fallow process be avoided; and where a proper plan is pursued in the consumption of the different green and other crops, an abundant supply of dung be provided for the further improvement of the land.

It has been stated by a late writer in his "System of Practical Husbandry," that the injurious consequences of cropping land with grain, and other kinds of crops, which deteriorate and exhaust in a high degree, may probably be prevented in the best manner on the more stiff and retentive sorts of land, whether of the clayey or loamy kinds, by the interposing of bean and clover or tare crops between them; as the experiments detailed above have shewn the former to possess the power of ameliorating the condition of such soils, and the latter seems not less calculated for the same purpose, as it is known to grow well on these sorts of land; and on those of a more light and dry quality, whether sandy, or of a gravelly nature, the intermixing of turnip, pea, and other crops of the same sort with those of corn may be equally successful. In many cases, especially on the more heavy kinds of soil, it may be necessary and highly beneficial to take two green crops for one of grain. This, it is remarked, is a practice that the results of the trials, just detailed, place in an advantageous point of view, and which has extended itself over a considerable tract of land, with great success, in

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in the county of Middlesex, and by which, from the cleanliness of the cultivation, and the great vigour of the land, in consequence of the few corn crops, the grain is found of a superior quality. It is indeed remarked by Mr. Middleton, a writer of considerable experience, that "land under common circumstances will not even bear without injury a corn crop every two years." This is fully shewn, he conceives, "by the turnip crops in Norfolk being uniformly found to be not only less certain, but much lighter than formerly, as well as from the same remark being applicable to the clover, and probably to the corn crops. Such diminutions in the quantity of produce, he supposes, demonstrate that the valuable and favourite rotation of that district, as turnips, barley, clover, wheat, is somewhat more than the ground can sustain, as it appears to be gradually sinking under too much exhaustion." With the aid of extensive sheep-walks, he conceives the soil not even capable of supporting the depressing consequences of the present courses of crops, particularly, when a five years' course, by introducing barley after wheat, is improperly employed.

Various rules have been laid down by writers on husbandry for regulating and proportioning the different sorts of crops to different kinds of soil. In the "Agricultural Survey of the County of Middlesex," the following are advised as the most suitable under the different circumstances and cases of soils:

For the *best* sorts of land, alternate green and white crops.

For those of a *full medium* quality, three green crops for two of the grain or white kind.

For *ordinary* land, two of the green for one of the corn kind. And,

For the worst or most exhausted, as downs and sheep-walks, three green crops for one of the white or grain kind.

These may be arranged as below to a still greater number of green crops.

COURSE I.

Alternate Green and White Crops.

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

COURSE II.

Two Green Crops to one of Grain.

- 1 Corn, or Pease.
- 2 Clover, Beans.
- 3 Pease, Corn.

COURSE III.

Three Green Crops to one of Grain.

- 1 Corn— or— 1 Corn.
- 2 Clover, 2 Clover.
- 3 Tares, 3 Pease.
- 4 Turnips, 4 Beans.

Which affords four crops in three years.

COURSE IV.

Four Green Crops to one of Grain.

- 1 Tares.
- 2 Potatoes, or cole for sheep feed.
- 3 Turnips.
- 4 Corn.
- 5 Clover.

Which affords five crops in four years.

COURSE V.

Five Green Crops to one of Grain.

- 1 Pease.
- 2 Beans.
- 3 Corn.
- 4 Clover.
- 5 Tares.
- 6 Turnips.

Which affords six crops in five years.

It is suggested, that by cropping in these ways and proportions, the land may be kept perfectly clean from weeds, and in a high state of cultivation; and that under such a system it might be continued in a perpetual state of tillage, "with a constant succession of large products." And that in addition, the farmer would be more certain of obtaining plentiful returns for his labour, expence, and exertion.

The able writer of the Survey mentioned above, wishes also to draw the attention of farmers, particularly where the soil is proper for barley, to the crops stated below, in the view of affording a continued successional *abundant supply* of the best kinds of *green food*, the whole year round.

Water meadows,

Rye-grass,

Rye, cut green,

Winter tares,

Clover, the first crop,

Spring tares,

Clover, the second crop,

After grass of meadows, clover, and seeds of all sorts.

Turnips,

Potatoes,

Cabbages, common sorts, favoys,

Cole, green boor-cole, and purple boor-cole,

Swedish turnips,

Turnip-rooted cabbage,

Kohlrabi.

Where these different crops are raised on a sufficient scale to the extent of the farm, and the quantity of *live stock*, there can be no inconvenience sustained, it is supposed, for the want of food for them, at any period or season of the year. "Water meadows, says the writer, afford a vast deal of food from the middle of March; rye-grass from the first of April; rye from the beginning of May; winter tares soon follow; then comes clover the first crop; spring tares; clover the second crop; and the after-grass of natural meadows, clover, &c. which will continue in perfection for heavy cattle till early sown turnips are ready. Late sown turnips and cabbages will be sufficient till the end of February, without storing; about which time the cole, Swedish turnip, and turnip-rooted cabbage will come in, and continue good through March, April, and even May, if needful." All which, he thinks, more than complete the circle of the year.

The variations of courses which are capable of being made use of under different states and situations of land are very numerous, but the following may be sufficient for the present purpose:

I. On strong wet soil, where a fallow is intended.

Course.

Course.

- | | | |
|-----------|----|-------------|
| 1 Fallow, | or | 1 Fallow. |
| 2 Barley, | | 2 Barley. |
| 3 Beans, | | 3 Clover. |
| 4 Wheat, | | 4 Beans. |
| 5 Tares, | | 5 Wheat. |
| 6 Barley, | | 6 Cabbages. |

7 Clover,

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- | | |
|-----------|-----------|
| 7 Clover, | 7 Oats. |
| 8 Beans | 8 Tares. |
| 9 Wheat | 9 Barley. |

It is the most improved practice in these cases to let the fallow be the preparation for the first corn crop, depending on some kind of green crop for those that follow, without any repetition of it.

Other courses in this case may be as below:

Course.

- 1 Fallow.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

Or in cases where manure is in plenty, it may be better thus:

Course.

- 1 Fallow,
- 2 Wheat
- 3 Beans
- 4 Barley
- 5 Clover
- 6 Wheat.

or

Course.

- 1 Cabbage, beans, or pease.
- 2 Barley or oats.
- 3 Clover.
- 4 Wheat.

Also,

Course.

- 1 Cabbage,
- 2 Oats
- 3 Beans
- 4 Wheat

or

Course.

- 1 Beans.
- 2 Wheat.
- 3 Cabbages.
- 4 Barley.
- 5 Clover.
- 6 Wheat.

And in some cases where the culture is well executed, the course may run in this way:

Course.

- 1 Turnips.
- 2 Oats.
- 3 Vetches.
- 4 Wheat.

In converting lands of these kinds to the state of tillage from that of grass or sward, by means of paring and burning, the proper course may be:

Course.

- 1 Cole.
- 2 Beans.
- 3 Wheat.
- 4 Beans.
- 5 Wheat.

It is the remark of the Rev. Mr. Cartwright, in an able Essay in the fourth volume of "Communications to the Board of Agriculture," that tares, though by some objected to with propriety, as coming too late in the spring season on such sorts of land, may be occasionally introduced with advantage, in the view of being eaten off by sheep, or mown green for horses, milch cows, young flock, and hogs. By these methods of cropping, with proper regard to the eating off the green crops on the ground, where it can be effected without injury; or to the removing them to be consumed in the fold yards, or other places, in order to the manure being afterwards applied; the ground may not only be ameliorated, by being rendered more rich and friable, but be preserved perfectly free from all descriptions of weeds.

In the generality of the heavier kinds of land of this description, when brought into tillage from the state of old

sward, it would seem that beans would be the most suitable crop to begin with, notwithstanding the most usual practice has been to have recourse to oats in such cases; as from the gradual decay of the turfy and grassy materials, the growth of the beans may be greatly promoted, and large crops thus produced. Besides, the roots of the bean plants, by their penetrating deeply, render the land more mellow, and at the same time improve it, bringing it more expeditiously to the proper state for wheat.

Where, however, the quality of the land is more light and mellow, pease are often capable of being introduced with greater benefit as a first crop after breaking up. However, in very old sward, from worms, grubs, and slugs being often prevalent in them, great injury may be sustained by the first crops from these causes: consequently the process of paring and burning should be adopted, or the use of the trench plough, that these and the grassy material may be got quit of as much as possible. And in this view it has likewise been advised, as of much advantage, to have such lands kept as closely sown as possible before the time of breaking them up; as by such a practice less *ova* may be deposited by the fly, and consequently fewer of such injurious animals generated. But in all such cases, beans are considerably less liable to suffer injury in this way than pease.

II. On Soils of the Sound loamy kinds where Fallows are excluded.

Course.

- 1 Turnips,
- 2 Barley,
- 3 Clover,
- 4 Wheat,
- 5 Cabbages,
- 6 Oats,
- 7 Tares,
- 8 Barley,
- 9 Beans.
- 10 Wheat.

Course.

- 1 Turnips.
- 2 Ruta baga.
- 3 Barley.
- 4 Clover.
- 5 Beans.
- 6 Wheat.
- 7 Beans.
- 8 Wheat.

or

On these courses it may be observed, that the soil must be in a high state of fertility to support the frequent recurrence of these exhausting grain crops; and that more green crops will frequently be required.

III. On the rich Kinds of sandy Soils.

Course.

- 1 Turnips.
- 2 Barley.
- 3 Carrots.
- 4 Barley.
- 5 Clover.
- 6 Wheat.

It would appear to be the practice of the best arable districts, on these two last sorts of soils, to have recourse to turnips as a preparation for barley, and clover that for wheat, in this way.

Course.

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

But in this course it may sometimes be proper to substitute oats in the place of the barley, as well as tares, chicory, or some other kind of artificial grass seed, in the room of the clover.

In bringing lands of these kinds into a state of tillage from that of grass or sward, where the practice of paring

ing and burning is employed, the proper course may be this :

- Course.*
 1 Turnips.
 2 Barley.
 3 Clover.
 4 Wheat.
 5 Turnips.
 6 Barley.
 7 Clover.
 8 Wheat.
 9 Turnips.
 10 Barley with feeds.

But where the land is only to be kept a short time under the tillage system, a more proper course may be :

- Course.*
 1 Turnips.
 2 Barley.
 3 Clover.
 4 Wheat.
 5 Turnips.
 6 Barley with grafs feeds.

In cases where paring and burning are not practised, which is not so common, it may be the best plan to begin with beans or pease dibbled, and then go on as above. But in cases of this kind, the turnip and clover crops are constantly to be eaten off, upon the land, by sheep, or some other kind of live stock. In the more dry and light soils of this description, pea crops may likewise be had recourse to as a first crop, especially the white sort under the dibbling practice ; then going on with the other crops in the above manner. In cases where potatoes are begun with, it will be requisite to have more of the ameliorating crops, in consequence of their greater effect in exhausting and injuring the land, as has been shewn by the experiments stated above.

In particular districts, on some soils, merely of the sandy sort, it is also the practice to make turnips the preparation for both grafs and grain ; and experience has shewn that there are few of these soils so light as not to afford such a crop. In cases of this kind, the course is usually thi :

- Course.*
 1 Turnips.
 2 Barley.
 3 Grafs feeds.

Here the grasses, being raised in the view of sheep feed, should of course be such as will stand for some time, as it is not by any means a good method to break up the land again too soon ; for the flocks fed upon the turnips in the winter season, are not provided with a due quantity of food on such *new layers* for their summer support.

In the county of Suffolk, as appears from the Agricultural Report of that district, on the better kinds of sandy soils, the layers are frequently planted with pease by dibbling, to much advantage, after being broken up, without being fed with sheep during the summer season : the succeeding crop of wheat being, in such methods, much larger. The following is considered as an excellent course on such sorts of soil :

- | | | |
|---|--|--|
| <p><i>Course.</i>
 1 Turnips.
 2 Barley.
 3 Trefoil and ray grafs.
 4 Pease dibbled.
 5 Barley.</p> | } Or, where the soils are poor, or of the nature of heath or sheep walk, to bring them into cultivation. | <p><i>Course.</i>
 1 Pare and burn for turnips.
 2 Turnips.
 3 Barley, with grafs feeds.</p> |
|---|--|--|

Where they are intended to be kept in tillage longer than this course, the turnip, barley, and grafs crops may be al-

ternately had recourse to, until the fifth or seventh year, or even longer, where it is supposed necessary. And here likewise, when potatoes are employed as the first crop after breaking up, from their deteriorating property being considerable, they must be succeeded by more numerous improving crops, as turnips and grasses, as shewn in the above courses.

In soils of this nature, which are of the poor, light, blowing kind, their want of tenacity must be corrected by the use of earthy substances of the clayey kind in suitable proportions, and the consuming of the crops upon the land by sheep. But where these means cannot be had recourse to, the course given above will be found highly proper and beneficial.

IV. *On the more dry Sorts of Soils, as the Limestone or calcareous Kinds, and those of the gravelly and stony Descriptions.*

- Course.*
 1 Turnips.
 2 Turnips.
 3 Barley.
 4 Saintfoin for ten years or more, then pared and burned for.
 5 Turnips.
 6 Barley.
 7 Pease.
 8 Wheat.

The dry, gravelly, and stony soils, where of the lighter descriptions, should be cropped in such a way as that their moisture may be preserved in them in the most perfect manner, and their fertility be impaired in the least possible degree. In this situation, two or more of the green sort of crops for one of grain may often be proper, as in the above courses ; or, in the following manner :

- Course.*
 1 Turnips.
 2 Barley.
 3 Clover.
 4 Wheat.
 5 Turnips.
 6 Barley, with grafs feeds.

And in many situations and circumstances of such lands, pease, tares, and cole may be had recourse to in the courses with great propriety and benefit. And where flints are abundant, from having been supposed incapable of being performed with facility, it has been suggested that the turnips should be sown thin, and a portion of cole feed be blended with them, by which an abundant supply of sheep food may be afforded. It has been also advised in these sorts of soils, that the corn crops, particularly those of the spring kind, should be constantly sown early, where the land is sufficiently dry, that they may be so forward as to cover the ground well before the hot season sets in, and thereby prevent the injury that must be sustained by too much dissipation of their moisture.

But that, on the heavier sorts of soils of this nature, beans or pease may often be made the preparation for barley, or even occasionally for wheat, in this way :

- Course.*
 1 Beans or pease.
 2 Barley.
 3 Clover.
 4 Wheat.

And the course may be further varied, by having recourse to tares and turnips, according as the state of the land may be suitable.

In regard to the thinner description of chalky soils, and such old down lands as are become so unproductive of

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herbage, as to be incapable of being continued any longer in the state of sheep walk or pasture, it has been proposed, as the best method of cropping them when brought under the plough, to make turnips or some other luxuriant green crop, which, while it keeps the land clean, and affords a large supply of green food for the support of sheep or other sort of live stock, is highly beneficial by preserving the humidity, which in such sorts of land is liable to be too rapidly carried off, the preparation for corn. The course in this view may stand thus:

Course.

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

Or in particular instances, as where feed weeds are apt to prevail in a high degree, two crops of turnips may be grown before any grain crop with much benefit. And in cases where such lands are designed to be kept for a greater length of time in the state of tillage, two crops of turnips may be again taken after the wheat, which will leave the land in a perfect state of preparation for barley; after which saintfoin may be introduced, as affording an excellent sheep pasture for a number of years. But in these cases the turnip and clover crops must always be fed off by sheep, which ought not to be removed from the land during the whole of the time the crops are in consumption; such other sorts of food as may be necessary being conveyed to them on the ground. In this way, it is imagined, the land will be left in the best state possible for the growth of barley, without the great trouble and expence which must otherwise be incurred for manure.

In cases where the soil is sufficiently friable and mellow in its nature, the method of cropping may be in this way:

Course.

- 1 Pease.
- 2 Oats.
- 3 Turnips.
- 4 Barley with grafs seeds.

Or where it is intended to continue the course, it may be done by going on with turnips or pease as before; concluding the course with saintfoin, as supplying a pasture for sheep for a number of years.

By properly attending to these directions in the courses of cropping, and the modes of managing such sorts of land, very considerable improvement may be made, both in rendering them capable of producing excellent crops of the grain kind, and in affording a much larger supply of green food for the support of sheep, and other sorts of live stock, than is commonly the case under other modes of cropping and consuming their produce.

V. *On the peaty kinds of soil, and such as have been long under the system of grain crops.*

Course.

- 1 Cole-seed, or turnips.
- 2 Cole-seed, or turnips.
- 3 Oats.
- 4 Ruta baga, or Swedish turnips.
- 5 Barley.
- 6 Grasses.
- 7 Grasses.
- 8 Grasses.
- 9 Grasses.
- 10 Potatoes.

- 11 Barley.
- 12 Tares, or pease.
- 13 Barley with grafs seeds.

In the business of cropping soils of the peaty, moory, and fenny kinds, it has been recommended by some writers, after freeing them by suitable draining from injurious moisture and wetness, that a difference should be made according as they are deep, or the contrary, in the superficial peaty covering. It is suggested that, in the former kind, the most suitable method may be that of making turnips, potatoes, cabbages, cole, or any of such sorts of crops, the plants of which produce much shade; and which, by preserving the moisture in the more superficial parts of the land, may promote their decomposition and decay, the preparation for corn; in which intention the course may be:

Course.

- 1 Turnips, cabbages or cole.
- 2 Oats.
- 3 Turnips, cabbages or cole.
- 4 Oats.
- 5 Clover.
- 6 Wheat.
- 7 Turnips, &c.
- 8 Oats with grafs-seeds, to remain some years.

It may be remarked here that potatoe crops, though they have been considered objectionable by some farmers from their great exhausting quality in this kind of land, have been shewn by experience to be highly beneficial and proper. Where this sort of crop is in use the course may be:

Course.

- 1 Potatoes.
- 2 Oats.
- 3 Turnips, cole or cabbages.
- 4 Turnips, cole or cabbages.
- 5 Oats with grafs seeds.

On this description of soil in the northern parts of Scotland, the use of potatoes, as a first crop, has been found, the author of Modern Agriculture says, by much the most certain and beneficial mode, the succeeding oat crops being not only in most cases more certain, but greatly more abundant and productive.

But on the thinner kinds of soils of this nature, as those of the moory and fenny sorts, with the subsoil of a stiff and retentive quality, it may be the most advisable to commence with cole, making it the preparation for corn, in this manner:

Course.

- 1 Cole,
- 2 Oats,
- 3 Cole,
- 4 Oats,

Course.

- 1 Cole.
- 2 Oats.
- 3 Beans with dung.
- 4 Potatoes.
- 5 Wheat.
- 6 Cole.
- 7 Oats.

But in the latter of these courses, in consequence of potatoes and wheat coming together, it is probable they may be too much for the land, as the experiments stated above have shewn them to be highly exhausting crops: a better plan may be, therefore, that of substituting beans in the place of the potatoes, in this manner:

Course.

- 1 Cole.
- 2 Oats with manure.

3 Beans.

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- 3 Beans.
- 4 Wheat.
- 5 Cole.
- 6 Oats.

And it is not improbable but that, in some cases of this nature, clover crops may be introduced as a preparation for the wheat. In this description of soils immense benefits and improvements may be produced by attention to proper modes of cropping.

In those circumstances where the dry quality of such soils, and their disposition to the production of a good turf or sward, is such as to admit of their being cultivated under the convertible system, or that of alternate grain and grass, which is often a most advantageous method; it will be proper, in directing the course of cropping, not only to consider the particular quality of the soil, but the growth of such sorts of roots and plants, or other crops, as may, while they tend to clean, improve, and prepare the ground for the production of abundant crops of grain and grass, be the most suited to the feeding, rearing, and maintaining of those descriptions of live stock which are capable of affording the most regular and abundant supplies of human food, at the different seasons or periods when they are the most wanted.

This is a system of practice which may often be carried on to great advantage and profit upon the loamy, gravelly, and fenny, as well as the thianer sorts of peaty soils; as in consequence of their having a great number of different green crops fed off upon the grounds, a degree of amelioration and improvement is effected, while they are under the tillage system, which must be highly beneficial for the production of grass; and by being occasionally laid down to grass for a short interval, and thickly stocked with sheep or other animals, they must become in an excellent state for being again brought under the plough. This is in short a sort of husbandry which has been found extremely beneficial in many districts. It is practised with vast advantage in the county of Northumberland; it having been there found that, on the sandy and dry light loamy soils, excellent grain crops, especially oats, may be grown by the lands remaining three years under grass, closely eaten with sheep, which could never be done while they were managed according to their old method of practice."

Under this system of management, on the more wet and stiff kinds of loam, where there is considerable fertility, the course of cropping may be as below, after first breaking up:

Course.

- 1 Beans or oats.
- 2 Turnips.
- 3 Barley.
- 4 Clover, or winter tares.
- 5 Wheat.
- 6 Turnips.
- 7 Barley.
- 8 Grass seeds for three, four, or more years.

Or,

Course.

- 1 Oats.
- 2 Beans.
- 3 Wheat.
- 4 Fallow and grass for four or five years.

On the dryer kinds of these sorts of soil, it is supposed better to begin in a somewhat different way.

Course.

- 1 Pease or turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.
- 5 Turnips.
- 6 Barley with grass seeds for not less than three years.

Or,

Course.

- 1 Oats.
- 2 Turnips.
- 3 Barley with seeds to remain three or four years.

But in cases where large supplies of green food are in demand, or danger is apprehended from the wire worm grub, &c., the course may be commenced with more propriety by turnips or cabbages.

In Cumberland, where different plans of cropping, in this view, are stated to have been attempted, the course of:

Course.

- 1 Turnips,
- 2 Barley,
- 3 Clover,
- 4 Wheat,

is said to have been made use of till there was an evident falling off in the crops, especially in those of the green sort; in which circumstances the only means of restoring the lands has been found to be that of permitting them to remain, after they have been three years under the plough, the same length of time in the state of grass; it being discovered that "by this mode nature has time to prepare a sufficient lea clod, which being turned up for the turnip fallow, will insure a vigorous crop of turnips, as it is well known they always flourish upon fresh land, or where they find the remains of a lea clod to vegetate in."

These, and various other facts of the same kind, fully shew that great advantage may be gained by cultivating lands under this alternate system of tillage and grass, especially when, with the proper knowledge of the nature and modes of managing different kinds of live stock, that of the best means of connecting them with this sort of tillage husbandry, is fully comprehended.

Where the land, after some time, is to be restored to the condition of sward, and the practice of horse hoeing had recourse to for preserving the different crops in a perfectly clean state; and the various green crops, as turnips, pease, and beans, are at the same time cultivated in double rows, on ridges of three feet in breadth, and those of the cabbage kind in single rows on the same ridges; the courses given below have been stated to answer well, by the Rev. Mr. Close, for any length of time, in all the different kinds of soils.

COURSE.

On Clays.

- 1 Turnips or cabbages.
- 2 Oats.
- 3 Beans and clover.
- 4 Wheat.
- 5 Turnips or cabbages.
- 6 Oats.
- 7 Beans and vetches.
- 8 Wheat.

COURSE.

On clayey Loams.

- 1 Turnips or cabbages.
- 3 1 2

Oats.

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- 2 Oats.
- 3 Clover.
- 4 Wheat.
- 5 Turnips or cabbages.
- 6 Barley.
- 7 Beans.
- 8 Wheat.

COURSE.

On rich or sandy Loams.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1 Turnips or Potatoes, and 2 Barley, 3 Clover, 4 Wheat, 5 Beans, 6 Barley, 7 Pease, 8 Wheat. | <h2 style="text-align: center;">COURSE.</h2> <ol style="list-style-type: none"> 1 Beans or turnips. 2 Barley. 3 Pease or clover. 4 Wheat. 5 Wheat for any length of time, or potatoes. 6 Barley. 7 Pease. 8 Wheat. |
|---|--|

COURSE.

On peaty Earth.

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat,
- 5 Potatoes.
- 6 Barley.
- 7 Pease.
- 8 Wheat.

COURSE.

On a chalky Subsoil

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.
- 5 Potatoes.
- 6 Barley.
- 7 Pease.
- 8 Wheat.

In cases of this kind it is suggested that ten acres in each hundred should be laid down with saintfoin for eight or ten years.

COURSE.

On Gravels.

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.
- 5 Potatoes.
- 6 Barley.
- 7 Pease.

COURSE.

On light Lands.

- 1 Turnips,
- 2 Barley.
- 3 Clover and rye-grafs.
- 4 Clover and rye-grafs.
- 5 Clover and rye-grafs.
- 6 Pease.
- 7 Wheat or rye.
- 8 Wheat.

The nature and principles on which the system of cropping ground should be founded, with the courses which have been found most beneficial in the most improved practice, on soils of different sorts and qualities, being thus pointed out, it may be proper to take a concise view of the modes which are actually followed in the best grain districts of the country; as this may serve to guide the tillage farmer in many points and circumstances, which could not be otherwise noticed.

It is remarked by the secretary to the board of agriculture, in his excellent Survey of the County of Norfolk, that in that great corn district, the principles of cropping, which have been constantly attended to for a long time, are those of avoiding the taking of two corn crops in succession, and of making turnips the preparation for barley, and grasses that for wheat and other sorts of grain.

The courses usually had recourse to on sandy lands and turnip loams, are the following. But the writer previously states, that the finest rye he met with in 1802 was on the farm of Mr. Bevan, which was raised after the culture of colc for two successive years, which was eaten off by sheep. The rye was put in on one earth to the extent of thirty acres, fourteen of which were upon a black sand: and Mr. Bradfield, his tenant, is stated to regularly pursue the course given below.

Course.

- 1 Turnips,
- 2 Barley,
- 3 Seeds,
- 4 Seeds,
- 5 Wheat,
- 6 Turnips,

} But if the seeds
} fail, changed to

Course.

- 1 Turnips.
- 2 Barley.
- 3 Vetches.
- 4 Turnips.
- 5 Barley.
- 6 Turnips.

By which in the sixth year, "the variation ceases, and it comes, as in the former, to turnips again. It is however added that to this system there are two great objections; in the fourth year the farmer has no summer food for sheep, and what is as had, he doubles his quantity of turnips; he also loses wheat in the course. To have two successive years of vetches, appears to be a better system, and a much less interruption, or rather none at all. If the first vetches are to be fed, grass-seeds might be sown with them for the second year, and this would save the expence of feed, vetches, and tillage, for that year. At Snetterton the course given below is employed by Mr. Fowel.

- 1 Turnips, drilled at 18 inches.
- 2 Barley ditto at nine.
- 3 Seeds.
- 4 Seeds.
- 5 Pease, drilled at twelve inches, or wheat at nine, &c., and this is the course of the whole neighbourhood.

Wheat, pease, oats, or rye, the fifth year; if rye, a bastard fallow for it: the second year, seeds.

About Hingham the course is in general

- | | |
|--|--|
| <ol style="list-style-type: none"> 1 Turnips, 2 Barley, 3 Clover, 4 Wheat, | <ol style="list-style-type: none"> 1 Turnips. 2 Barley. 3 Clover. 4 Pease. 5 Wheat. |
|--|--|

And about Watton it is

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

In one field near his farm yard, Mr. Blomfield, at Billingford, had

- 1 Winter tares, and then turnips.
- 2 Barley.

And

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And the crop always good; and Mr. Drake gets better turnips after wheat, the stubble ploughed in, than after pease." However, Mr. Wright of Stanhow never takes barley or pease after wheat, though his soil is a good loamy sand; he thinks that no district where this is the practice deserves the reputation of having the true Norfolk husbandry;" while Mr. Drozier remarked, that upon the sandy land of Rudham, and that vicinity, the greatest improvement perhaps would be, to lay down for eight or ten years, to repose the land from turnips and corn, which would so freshen it as to render it productive perhaps in the style of the first breaking up; but common grasses wear out, and will not pay the present rents after two years; they sow trefoil and ray."

Sir Mordaunt Martin's course is a five shift:

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.
- 5 Potatoes, mangel wurgel, or vetches, &c.
- 6 Turnips.
- 7 Barley.
- 8 Trefoil and ray.
- 9 Pease.
- 10 Potatoes, mangel wurgel, vetches, &c.

It is added that "Mr. Overman of Burnham has found, from many observations, that pease do not succeed well if sown oftener than once in twelve years: where he has known them return in six or eight years, they have never done well. He ploughed up a layer of four years, and drilled wheat upon it—then ploughed for winter tares; ploughed the stubble once for a second crop of wheat, which the writer viewed; a very fine produce, and as clean as a garden. Three crops of great profit, on only three ploughings, and yet the land kept perfectly clean. Not a little resulting from four years sheep feeding without folding from it.

His common course is

- 1 Turnips.
- 2 Barley.
- 3 Seeds.
- 4 Ditto.
- 5 Ditto.
- 6 Wheat.
- 7 Turnips.
- 8 Barley.
- 9 Seeds.
- 10 Ditto.
- 11 Pease.
- 12 Wheat.

But with the variation of having part of the twelfth under pease on the three years layer, and also some tares. This course is partly founded on the experience of pease not doing well, if sown oftener than once in twelve years."

And by Mr. Coke;

- 1 Turnips.
- 2 Barley, drilled at $6\frac{3}{4}$ inches.
- 3 Seeds.
- 4 Ditto.
- 5 Wheat, drilled at 9 inches.
- 6 Turnips.
- 7 Barley, drilled at $6\frac{1}{4}$ inches.
- 8 Seeds.
- 9 Ditto.
- 10 Pease, drilled at 9 inches, or tares at 6 inches.
- 11 Wheat, drilled at 9 inches.

Mr. Purdis of Eggmore has a very uncommon variation from the general husbandry:

- 1 Turnips.
- 2 Barley.
- 3 Seeds.
- 4 Ditto.
- 5 Tares.
- 6 Wheat.

It is added, that "upon a large part of this fine farm the former course or rotation included a summer fallow, which afforded (broken at whatever time) little food for live-stock; tares now occupy the place, and support immense herds of cattle and sheep. What a noble spectacle, says the author, is this farm; 300 acres of turnips, 300 of barley, 600 of seeds, 300 of tares, and 300 of wheat; 1,800 acres arable, the crops luxuriant, much the greater part of the farm very clean, all of it except the layers, on which, however, are some thistles, too difficult to extirpate."

"But Mr. Thurtell, near Yarmouth, is in the four-shift, returning to turnips always after the wheat, for he thinks that nothing is so bad as taking a fifth crop." And at Caistor in Fleg, the land excellent, they are in the five-shift of East Norfolk; that is,

- 1 Turnips,
- 2 Barley,
- 3 Clover,
- 4 Wheat,
- 5 Barley;

with two variations practised sometimes by Mr. Evorit at the Hall farm:

- 1 Cole seed instead of turnips and barley.
- 2 Ditto.
- 3 Wheat.
- 4 Barley, but not a great crop, and then turnips again.

"The other is to substitute pease instead of clover, followed by wheat, and then in the four shift, to come again to turnips." But a remarkable circumstance in the rotation of crops here is, that spring corn will not succeed well after wheat, which follows cole seed; they will give an excellent summer fallow for this crop; spread 14 loads of fine dung *per* acre, and sowing wheat after the cole get the finest crops; yet if barley or oats follow, the produce is seldom tolerable; oats better than barley, but neither good.

By some farmers at Hemefby, the courses or rotations are,

- 1 Turnips.
- 2 Barley.
- 3 Seeds, (clover once in 10 or 12 years.)
- 4 Wheat.
- 5 Pease, or oats.
- 6 Wheat.

"It may easily, says the author, be supposed that the wheat of the fourth year is much better than that of the sixth. The course cannot be defended even on Hemefby land, and the wheat stubbles were some of them not so clean as they ought to be."

And "at Thrigby, Mr. Brown, &c. is, he says, in the Fleg five-shift; barley after the wheat, with the variation, to avoid clover every other round, of sowing half the barley with other seeds, and dibbling pease on the other half.

But at South Walsham, Mr. Syble and others:

- | | | |
|---|---|---------------------------|
| Unworthy of Norfolk in any case whatever. | } | 1 Turnips. |
| | | 2 Barley. |
| | | 3 Seeds, one or two years |
| | | 4 Wheat. |
| | | 5 Barley or oats. |
| | | 6 Pease. |
| | | 7 Wheat. |

The variation of the seeds is to prevent clover coming two rounds

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rounds together, as the land here, as elsewhere, is sick of it. Upon a part white clover, trefoil, and ray, are substituted, and left two years; about one third of the wheat is on a two years layer. If the clover be a good crop, the wheat is better than after the other seeds. The barley after wheat (if that followed a two year's lay) is better than after turnips. But Mr. Syble, if the land is foul after the first wheat, is sure then to take turnips. Sometimes pease on a two years lay, and then wheat; but he does not like pease, from their being so liable to failure. He is of opinion, the reporter says, that the husbandry of Fleg and Blonfeld wants variation, from having been kept too long in a regular course. One, which has succeeded with him, is to sow barley after pease or vetches, in which way he has had great crops. It is added that at Repps and Martha the common Fleg five-shift husbandry, that is, barley follows wheat, clover and other feeds alternately, and the wheat is as good after the one as the other; and at Ludham, the common five-shift. "But that at Catfield he found a variation; there the course is a six-shift husbandry:

- 1 Turnips.
- 2 Barley.
- 3 Clover, &c.
- 4 Clover, &c.
- 5 Wheat.
- 6 Barley.

"It is also stated, that Mr. Cubit practises this in common with his neighbours: the seeds sowed the second year before harvest, that is, rice-banked, raftered, half ploughed: some sealed: a clean earth as thin as possible: this management Mr. Thurtell reprobated for his soil: and what is singular, they seem to do it with equal reference to dibbling and broad-casting."

And Mr. Repton, at Oxnead, has been, from the year 1773, regularly in the six-shift husbandry of,

- 1 Turnips,
- 2 Barley,
- 3 Seeds-hay,
- 4 Seeds-ollond,
- 5 Wheat,
- 6 Barley;

which is common throughout the county.

But Mr. Reeve, of Heveringland, is in the five-shift; the seeds two years: and with Mr. Bircham, at Hackford:

- 1 Turnips.
- 2 Barley.
- 3 Clover and other feeds alternately.
- 4 Clover and other feeds alternately.
- 5 Wheat.
- 6 Barley, oats, or pease.

"But, if the land be out of condition, the method to recover it is, to take,"

- 1 Turnips.
- 2 Barley.
- 3 Turnips.
- 4 Barley.

But Mr. Johnson, of Thurning, thinks, that the common course of

- 1 Turnips,
- 2 Barley,
- 3 Seeds two years,
- 4 Seeds,
- 5 Wheat,
- 6 Barley;

which is the usual system about him, would be improved by the following variation:

- 1 Turnips,

- 2 Barley,
- 3 Seeds,
- 4 Seeds,
- 5 Seeds,
- 6 Pease,
- 7 Wheat,
- 8 Barley;

"in which the land would have rest for feeding, three years in eight, instead of two in six, as in the other."

With Mr. England, at Bingham:

- 1 Turnips,
- 2 Barley,
- 3 Seeds,
- 4 Seeds,
- 5 Wheat;

"never adding barley after the wheat. Sometimes, on tender land, not equal to wheat, drills pease on the ollond; and then, if the land be clean, takes barley, or even wheat; but not without rape-cake."

And Mr. Reeve of Wighton:

- 1 Turnips.
- 2 Barley.
- 3 Trefoil, white clover, and ray.
- 4 Ditto.
- 5 Wheat, drilled.
- 6 Turnips.
- 7 Barley.
- 8 Clover.
- 9 Wheat.

It is observed, that "every idea of this most accurate farmer merits much attention; and this course among the rest: whenever red clover is left a second year, it disappears, and the land is principally covered with ray-grass: query if it is not much better when red clover is the object, never to leave it two years: this is an improvement in Mr. Reeve's intention; but it has not been his general practice." He mucked a barley-stubble for vetches; ploughed once for that crop; and then drilled wheat on one other ploughing. The stubble clean as a garden.

Mr. M. Hill has

- 1 Turnips.
- 2 Barley.
- 3 Seeds.
- 4 Seeds.
- 5 Wheat.
- 6 Turnips.
- 7 Barley.
- 8 Seeds.
- 9 Pease, or tares.
- 10 Wheat.

It is likewise observed, that he has now (1801) on his farm, a very fine field of wheat, drilled on a flag of a four years layer: he remarked it, the reporter says, as an instance of confidence in his landlord (Mr. Coke), not to have broken it up sooner at the end of a lease. The same farmer sows cole after winter vetches fed off; eats it off at Michaelmas; sows rye for spring feed; eats that off, and tills for turnips, getting four green crops, to feed, on the land in two years. This is excellent husbandry, says the writer of the report.

There are many other courses, or modes of cropping, detailed, but it is unnecessary to notice more of them in the present view.

In the county of Essex, as in most other tillage districts, the courses of crops are extremely various, according to soil and circumstances; there is, however, in some cases, a disposition in the farmers to too much fallowing, which, probably, proceeds from the great desire which they have to keep

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keep the land clean, a fallow, or fallow crop, being consequently generally interposed between every two of white corn

In the district about Felstead, Great Waltham, and the Roodings, &c., on their cold strong loams, and poor loams on white clay, the course commonly pursued is that of crop and fallow, with some variations, by means of tares, clovers, pease, beans. The crop and fallow thus :

1 Fallow,	or	1 Fallow.
2 Wheat,	—	2 Barley.
3 Fallow,	—	3 Clover pease, or beans.
4 Barley,	—	4 Wheat.

But the following course is suggested as more proper :

- 1 Fallow,
- 2 Barley,
- 3 Clover,
- 4 Beans,
- 5 Wheat,
- 6 Tares,
- 7 Wheat,

applying the dung for beans.

On this, it is remarked, in the Agricultural Report of the county, that the fallow for barley is their own practice ; that the clover is near enough to receive what benefit it has to give ; that the clover and manure would secure beans, and afford an ample season for mucking, which is of much consequence on such soil ; that the wheat prepared for by the double fallow of clover and beans would be good ; while winter tares sowed would leave sufficient time for the most valuable fallow season, July, August, and September ; of course, little reasonable doubt could be entertained of the seventh year.

In the coast district, on the fine impalpable loams and clays of Bradfield and Wicks, the course with Mr. Hardy is :

- 1 Fallow.
- 2 Barley.
- 3 Clover, red or white ; generally red.
- 4 Wheat.
- 5 Beans.

When the clover misses, beans are substituted in its stead. And on the turnip loams of the same sort, turnips are substituted instead of the fallow, except on about one-fifth, which is under pease. On suggesting the propriety of wheat for a sixth year after beans, it was objected to from the danger of the black grass, or mouse-tail, choking it, as had often happened.

It is general, in all this part, never to put wheat in on a fallow, but always barley or oats, as the wheat never succeeded in this way. Beans have been tried on clover, and the wheat after the beans, but not with much success, merely from the bad effects of the black grass.

On land which is too heavy for the turnip culture, this mode of cropping is pursued by Mr. Woodrooffe at Ramsay.

1 Fallow,	or	
2 Barley,	—	
3 Clover,	—	3 Beans or pease.
4 Wheat,	—	4 Wheat.
5 Beans,	—	5 Beans.

These fifth crops are only had recourse to in cases where the ground is in a good condition, from the use of manure. The beans being well hoed and cleaned, it is considered good husbandry to fallow after them, as a double cleaning is thus given to the land, for though much is done by hoeing, it does not fully destroy either thistles or black grass ; while hand-weeding extirpates the latter completely.

This old five-course shift is thus varied, with good effect by Mr. Blythe :

- 1 Fallow.
- 2 Barley.
- 3 Clover, white ; and ray-grass for two or three years.
- 4 Wheat.
- 5 Beans.
- 6 Wheat.
- 7 Beans.
- 8 Wheat.

This is done, without injury, from the black grass. The laying down two or three years, or as long as may suit the object of live stock, is such a check to black grass, that much of the success may depend upon it ; but besides this, it lessens the great expence incurred in the tillage in such cases, and leaves the land greatly improved.

On remarkably fine mould, on a gravelly bottom, on the level vale-land of Gold Hanger, close to the sea wall, the course followed by Mr. Lee of Maldon, is this :

- 1 Turnips manured with 20 to 25 loads of dung, and ploughed for eight times.
- 2 Oats, some barley.
- 3 Clover, red and trefoil : both mown and fed crops very great.
- 4 Wheat ; average four quarters.
- 5 Beans dibbled, six rows on an eight-furrow ridge, hoed three times ; produce four quarters and a half.
- 6 Wheat, 4 quarters.

Oats here much more advantageous than barley after the turnips.

On fine sandy loam, Mr. Pattison of Maldon, on Spital farm, follows this course :

- 1 Fallow.
- 2 Oats, six quarters, or barley five quarters.
- 3 Clover, red and mown.
- 4 Wheat, four quarters.
- 5 Beans, four quarters.
- 6 Wheat, three quarters and three-fourths.

And at Burnham, on light land, Mr. Wakefield follows :

- 1 Turnips, fed by sheep.
- 2 Oats, or barley.
- 3 Clover.
- 4 Wheat.
- 5 Mazagan beans, or pease, well hoed three times.

And on his medium marsh-land, on which turnips cannot be fed,

- 1 Coleseed feed.
- 2 Oats, (never barley).
- 3 Clover.
- 4 Wheat.
- 5 Beans of any sort, (pease never).

On a field of good land, Mr. Spurgeon's practice was as below, which is suggested, as removing "some steps the necessity of repeated fallows."

- 1 Fallow : soon after 70 loads an acre of chalk and earth compost.
- 2 Oats.
- 3 Clover manured, and none after.
- 4 Wheat.
- 5 Mazagan beans ; the stubble well *cased* for.
- 6 Wheat.
- 7 Pease ; the stubble well *cased* for.
- 8 Wheat.
- 9 Tares, well *cased* for.
- 10 Wheat ; the stubble quite clean.

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And on land fit for turnips, near Rochford, Mr. Barrington pursues ;

- 1 Turnips.
- 2 Oats, very little barley.
- 3 Clover ; tares, pease, or beans, if a failure.
- 4 Wheat.
- 5 Oats.

But if good land,

- 5 Beans.
- And when very good,
- 6 Wheat.

About Yieldham, where the soil is too heavy for turnips, the usual course is ;

- 1 Fallow,
- 2 Barley,
- 3 Clover,
- 4 Wheat ;

and when the clover land is mucked for wheat, sometimes

- 5 Oats.

Clover sown once in four or five years is, however, apt to fail ; consequently, variations are formed by pease, beans, or tares, and clover does well once in eight years.

In some cases the course of,

- 1 Fallow,
- 2 Coleseed,
- 3 Wheat,

is pursued with success.

On turnip land at Layer de la Haye,

- 1 Turnips.
- 2 Barley or oats.
- 3 Clover.
- 4 Wheat.
- 5 Pease or oats.

At Chesterford, on loamy soils or gravel, while open field, the flock farms are thus cropped.

- 1 Turnips.
- 2 Barley.
- 3 Pease or oats, if pease.
- 4 Wheat.

When enclosed, changed to,

- 1 Turnips.
- 2 Barley.
- 3 Clover, by some trefoil.
- 4 Wheat, and by some
- 5 Tares.

At Boreley, the course pursued by Mr. Coker on different sorts of land, are these,

<i>On Strong Land.</i>	<i>On Dry Land.</i>
1 Fallow,	1 Turnips.
2 Barley,	2 Barley.
3 Clover,	3 Clover.
4 Wheat,	4 Wheat.
5 Beans or pease,	5 Pease.
6 Tares.	
7 Oats.	

But by changing red for white clover or trefoil one round, clover will then stand well.

In the practice of Mr. Sewell, at Maplestead, in the view of banishing fallows from strong as well as light lands, the following courses in one field have been successful for some years.

- 1791 Turnips mucked for and drawn,
- 1792 One ploughing for carrots for seed ; crop $3\frac{1}{2}$ cwt. *per acre*, at 63s.
- 1793 One ploughing for wheat, 18 bushels *per acre*.
- 1794 One ploughing for winter tares, mown green for soiling.

1795 Three ploughings for barley ; six quarters and a half.
1796 Clover, half-fed, half-mown ; then all seeded ; 4 bushels *per acre*.

1797 Mucked for wheat, the fed and mown equal $3\frac{1}{2}$ quarters.

1798 Windfor beans dibbled at 18 inches ; three quarters.

1799 Wheat ; twenty bushels.

1800 Pease ; four quarters and a half.

1801 One ploughing for oats ; six quarters.

1802 Trefoil seeded : badly got in ; nine bushels at 20s.

1803 Wheat ; twenty-two bushels.

1804 So much trefoil came up, that it was dunged and seeded, but failed ; only four bushels *per acre*.

1805 Windfor beans, oats and pease, fair crop.

Next year summer fallow.

And Mr. Sperling follows.

1 Turnips, half drawn, half fed, in alternate ridges on dry land-fallow.

2 Barley, or oats, alternately.

3 Clover, red, white, or trefoil.

4 Wheat.

And when the land is in good order adds

5 Beans.

6 Wheat.

Wheat never sown on fallow, which is bad husbandry.

At Bocking, Mr. Saville follows.

1 Fallow or turnips, according to soil.

2 Barley.

3 Clover, the dung on the barley stubble.

4 Wheat.

5 Oats, by some, but here not allowed.

The variation where clover fails, is tares or pease.

He is stated as commencing an interesting variation, in that of the alternate system of corn and grass. In which view, white clover, and ray grass, have been sown for two or three years past, in one field each year, with coleseed for feeding by sheep, having twelve acres in the whole ; the cole being a good crop, with a beautiful plant of the grasses amongst it, even where the thickest and highest. It is intended to feed or mow this grass, for three, four, or five years, as circumstances may direct, and then to break it up with the expectation of good corn crops. It is suggested that he will not be disappointed, but that "the success with ray demands close feeding and no mowing."

And the same gentleman is stated as having another idea which has a tendency to lessen the expences of fallows, and which promises in certain cases to be beneficial ; it is that of ploughing the intended fallows as early as possible, and to harrow in cole, to be used as spring feed for sheep.

At Barking, with Mr. T. Pittman a common course is,

1 Potatoes,

2 Wheat,

3 Clover sown in April,

5 Wheat ;

and then potatoes again, but with some variation, as that of putting them in on the clover, which is found to afford better crops than corn stubbles.

These are some of the courses which are practised in this extensive district, but various others are met with.

In the county of Hertford, where, on the clays and strong loams, the fallow system is still in practice, the following courses, Mr. Young says, are commonly in use about Sawbridgeworth.

1 Fallow.

2 Barley.

3 Clover.

4 Wheat.

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- Also, 1 Fallow,
2 Barley,
3 Peafe.
4 Wheat.

- And 1 Fallow.
2 Wheat.
3 Fallow.
4 Barley.

Many farmers pursuing,

- 1 Fallow.
2 Wheat.
3 Fallow.
4 Barley.
5 Clover.
6 Oats.

“ It is however observed, that whatever fault may be found and perhaps justly, with so much fallowing, it must be admitted that their crops are good.”

On the authority of Mr. Byde of Ware Park, all the turnip land he knows in the country is stated to be managed in this manner.

- 1 Turnips.
2 Barley.
3 Clover, the first crop mown, the second fed.
4 Wheat, good farmers stopping here, and bad ones adding
5 Oats.

“ And the turnips may be reckoned at 50s. an acre ; the barley three quarters, and the wheat 17 to 20 bushels.”

But the strong heavy soils are thus cropped :

- 1 Fallow.
2 Wheat.
3 Fallow.
4 Barley.
5 Clover.
6 Oats.

Varying the course thus :

- 1 Fallow.
2 Wheat.
3 Clover.
4 Barley.
5 Fallow.
6 Wheat.
7 Oats, peafe, or beans.

An acre of wheat yields 25 bushels.

And on the same authority it is stated that about Watford there is a peculiar course of,

- 1 Fallow.
2 Beans, on which they put all the dressing.
3 Wheat.

And at little Hodham they have a course of,

- 1 Fallow, ploughed four times,
2 Wheat,
3 Fallow, four or five times ploughed,
4 Barley :

the only variation being, sometimes

- 5 Clover,
6 Oats.

But Mr. Jones is, it is observed, decidedly of opinion, that the crop and fallow course is the most profitable. He asserts that beans will not succeed on this soil. The writer, however, says he knows they will on land exactly such in Suffolk, and give four quarters *per* acre.

About Westmill the course is :

- 1 Fallow, ploughed four times.
2 Wheat.
3 Clover.

- 4 Barley on three earths.
5 Peafe.

But Mr. Whittington on light land cultivates,

- 1 Turnips.
2 Barley.
3 Clover.
4 Wheat ; and if the land is in good order he adds,
5 Peafe, or oats.

On clay land his course is,

- 1 Fallow,
2 Wheat,
3 Peafe ;
or, 1 Fallow,
2 Barley,
3 Peafe ;
or, 1 Fallow,
2 Wheat,
3 Clover,
4 Oats ;

and this he reckons better than either of his former.

On proposing barley on a fallow with clover, and then beans and wheat he objected, that if clover is sown at the time of sowing barley, it gets so forward as to spoil the crop ; and if sown at rolling, it is apt to fail. This the writer, however, cannot admit to be fair reasoning in a country where it is common to sow clover on wheat in the spring, and even so late as May and July.

On much of the poor hungry gravel in the open fields near Hatfield, let at 7s. *per* acre, the course is,

- 1 Fallow.
2 Wheat, producing two or three loads (five bushels).
3 Oats, producing 4½ or three quarters.

On better land they cultivate,

- 1 Turnips, sheep fed.
2 Barley ; four quarters are produced on an average.
3 Clover twice mown, two loads are grown.
4 Wheat, 22 bushels are reaped.
5 Oats, or peafe.

This is the course of Mr Cassmajor, at North Mimms :

But his course on wet land is,

- 1 Summer fallow.
2 Barley, four quarters are grown.
3 Clover, twice mown, and 2½ loads at the two are grown.
4 Wheat, four or five loads are reaped.
5 Oats, peafe, or beans ; three to four quarters of either are the amount of the produce.

“ But the last crop in either case is only taken when the land is in high order.” It is stated, that in this “ there is a proof of the impropriety of the question, whether clover may safely be sown with barley on land in high order ; the point on which the objection to clover sown with barley on land summer fallowed is founded.” It is observed that Mr. Leach follows the under mentioned course.

- 1 Turnips.
2 Barley.
3 Clover.
4 Wheat.
5 Oats, or peafe.

Then they return to turnips on some land ; but on about 40 acres of gravel, he sows,

- 1 Turnips.
2 Barley.
3 Trefoil, white clover, ray grass, common clover fed.
4 Ditto. fed.
5 Ditto. fed.

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6 Oats, on one earth.

7 Three earths are given immediately after oats, and then wheat is sown.

8 Winter fallow for barley.

9 Grasses, as before, for three years :

and then the land is cultivated as above. "Thus, says the writer, these 40 acres neither want nor have any manure more than they receive from the feeding of the sheep on them, and from 60 bushels of ashes *per* acre, spread the first year on the grasses only, and 30 bushels of foot *per* acre on the wheat. It has answered greatly for 18 years to his full satisfaction. He made it a rule to feed his land as bare as possible, and always wishes not to let the ray run to bent."

And it is observed, that lady Melbourne has a field, which has been thus managed.

1 Potatoes were planted on it and well manured, and the produce amounted to 400 bushels per acre.

2 Wheat was drilled on it, at the distance of nine inches. The crop amounted to seven loads, or 35 bushels, an acre.

3 Winter tares were next sown, for which 12*l.* an acre were this year (1803) offered; but they were mown for soiling; and at present the turnips after them are good.

4 Barley will be drilled next spring, as the fourth crop.

"Mr. Young of Hurrall, who farms on a large scale, with much intelligence, pursues the common course of taking oats or pease after wheat. It is extraordinary, says the author, to see how general this practice is; but if the clover is at all foul, he passes over this crop and sows turnips. The same course holds to St. Albans, and he found it steady on the fine farm of 483 acres, of Mr. Clarke, at Sandrigbury." But Mr. Biggs, near that town, omits the oats after wheat, returning to fallow for turnips, instead of an after crop, except on 20 acres nearly in a year, which he sows with pease.

Tares he sows on the wheat stubble, and grows good turnips the same year. On his heavier strong land, of which he has not much, his course of crops is :

- 1 Fallow.
- 2 Barley.
- 3 Pease.
- 4 Fallow.
- 5 Wheat.
- 6 Beans.

And that "the common Hertfordshire course of 1 turnips, 2 barley, 3 clover, 4 wheat, 5 oats, continues about Watford, Rickmansworth, and all around Berkhemsted and Hempsted." But Mr. Jennings of the latter place, has a course,

- 1 Fallow.
- 2 Wheat.
- 3 Pease, drilled.
- 4 Barley.
- 5 Clover.

6 Wheat, but not in general, only as a variation from his common course.

It is noted, that "Mr. Cotton, of the same place, observed, in defence of the common practice of taking oats after wheat, that they are the black oat, which, according to his opinion, succeeds best in land held together by roots, though of weeds which will yield better than land in tilth, though clean; and this makes a bad manager in many cases, obtain a better crop of black oats than a good farmer would produce on the same land."

"The old course continues to Beechwood and Market-Street; where, if clover fails, they sow pease, followed either

by turnips or summer fallow. They sow winter tares after wheat, three bushels *per* acre. They use them for feeding and soiling, and then fallow for turnips, or give a bastard fallow for wheat; but the crop is not so good as on clover." Round Hitchin, in every direction, the old course of five shifts is continued: it is, however, varied by a few, by,

- 1 Turnips.
- 2 Barley.
- 3 Barley.
- 4 Clover.
- 5 Wheat.

And by some a sixth shift of oats is added.

In the open land they follow a course of

- 1 Fallow.
- 2 Wheat or barley.
- 3 Oats or pease.

But sometimes sow turnips, by agreement, on the fallow.

"Mr. Sedgwick, of Rickmansworth, on stony land, pursues a course of,

- 1 Fallow.
- 2 Wheat.
- 3 Oats or pease.

On dry land this is the common course, but often turnips are sown after wheat. If a field grows so tired of clover as to want a change, their course is then;

- 1 Turnips.
- 2 Wheat.
- 3 Barley, or pease, or oats.
- 4 Turnips.
- 5 Barley.
- 6 Clover.
- 7 Wheat.
- 8 Oats.

And Mr. Parker, at Munden, sows

- 1 Turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

Upon which "he remarks, that by this course the land is favoured, as oats never follow wheat. If dung should run short, and a farmer not have it in his power to manure all his turnips, he may venture to sow a field of turnips without dunging, and succeed; a practice by no means to be depended on in the common rotation of taking oats after wheat. In order to favour the land, he has occasionally omitted sowing the clover, and taken pease for one round; but he suffered in his wheat; so that he scarcely knows what to do in the awkward circumstance of the failure of clover." "And when clover fails at King's Langley, some farmers sow pease, others (but this is not common) fallow for wheat, and then take oats:" and the earl of Essex sows, near his farm-yard,

- 1 Tares, and then turnips.
- 2 Barley.
- 3 Clover.
- 4 Wheat.

And Mr. Young "saw at Cashiobury very fine turnips after tares used in soiling, though sown twice and three times. This course affords, he says, much provender for the yard, in tares and clover for soiling, and turnips for staling. In other parts of the farm, oats follow wheat:"

But at Chesshant they sow

- 1 Turnips.
- 2 Wheat.
- 3 Clover.
- 4 Wheat.

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Also,

- 1 Fallow.
- 2 Wheat.
- 3 Oats, pease, or beans.

On the clays of Albury, Pelham, &c. their course of crops is,

- | | |
|-----------|-----------|
| 1 Fallow, | 1 Fallow. |
| 2 Wheat, | 2 Barley. |
| 3 Oats. | 3 Pease. |

Some courses consist of, 1 fallow, 2 wheat, 3 fallow, 4 barley; clover is also added with wheat; and oats and barley sometimes. They feed their clover in the spring, and then give a bastard fallow for wheat or barley. In the extensive open fields about Darkway, the writer finds the rotations to be,

- 1 Fallow.
- 2 Wheat.
- 3 Oats.
- 4 Fallow.
- 5 Barley.
- 6 Pease.

The same in the open fields (and all are open) about Roylton. There are no inclosures, he says, in the parish, except small patches, quite in or near the town. And "Mr. Foster, of Roylton, practises a husbandry which long ago the writer publicly recommended; not that he took it from that recommendation, but his practice has confirmed it."

Common Course.

- 1 Fallow,
- 2 Wheat,
- 3 Oats,
- 4 Fallow,
- 5 Wheat,

Mr. Foster's Course.

- 1 Fallow.
- 2 Wheat.
- 3 Clover and trefoil.
- 4 Ditto.
- 5 Wheat.

It is noted that the "feeds are sown on the wheat in March. The first year he tops them in May, and then mows the ground for hay or feed. The second year, the flock-master feeds them with the rest of the fields; but the grass entices the sheep to the spot, and dresses it consequently better than other parts, and his following wheat has always been much superior to, that fallowed; even to the degree of beating that on which *3l. 4s. per acre* have been bestowed in dressing: a clear proof that so much fallowing is a real injury to the land. Besides this, he keeps two horses in eight fewer than before he practised this husbandry." But Mr. Doo of Bygrave is in the Norfolk four-shift course, leaving out the oats taken so commonly in Hertfordshire. If clover fails, he sows turnips; and if turnips fail, carries on the fallow for barley. This is excellent husbandry, the writer says.

However, round Baldock, generally, but with some exceptions, oats are taken after the wheat. And Mr. Smith of Cloth-hall, has a course of,

- 1 Fallow.
- 2 Wheat.
- 3 Clover.
- 4 Oats or barley.

And the four shift turnip course.

In the open field he finds,

- 1 Fallow.
- 2 Barley.
- 3 Pease.
- 4 Fallow.
- 5 Wheat.
- 6 Oats: this by agreement.

And in the open field near Baldock, he finds another course by a singular agreement.

- 1 Turnips.
- 2 Barley.
- 3 Barley.
- 4 Clover; which the parish flock-master eats till the last Thursday in May; then removes his sheep, and the farmer lets it stand for feed.
- 5 Wheat.
- 6 Oats.

It is suggested by the writer, that the practice in these courses, of commonly taking a crop of oats after the clover land wheat, is incorrect in a very high degree. "It is, says he, putting in a corn crop the fourth from the fallow, for though clover is certainly to be esteemed a fallow respecting amelioration, yet, in that of cleaning land, it is by no means powerful. If there is any couch in land, it is sure to increase very considerably while the land rests from tillage. This circumstance makes it such ill husbandry to leave broad clover a second year. To sow wheat on one ploughing, which can destroy no root-weeds, and then to put in a second crop of corn, must, in the nature of things, he supposes, be injurious by encouraging weeds. But what is the motive, he asks, for this conduct? Those who say that the land will bear it, simply assert that profit is thus to be gained, provided the land be kept in heart. He could never, he says, understand this, nor upon what principles the idea can be founded; and in order to place the question in the clearest light, it appears to him that nothing more can be necessary than to contrast the two courses for any given number of years."

And upon the courses in the clay district, where the fallow system is found, he remarks, that "great crops are gained in favourable years, is, an undeniable fact. But great as these exertions are, these exertions are little or no security against bad seasons, which form a very material deduction from their profit. That husbandry, upon the long run, will be most beneficial which is calculated by a variation of crops to be advantageous with a moderate produce. When a year's fallow and manuring are given to one crop, a moderate produce will not be a profitable return: if the farmer has not a great success, he has loss, and consequently his hazard is considerable. The course he wishes to see tried effectually is this:

- 1 Fallow, in partial compliance, not with his, but with the opinion of others.
- 2 Barley.
- 3 Clover.
- 4 Beans.
- 5 Wheat.

"All the manure should, he says, be laid for the beans. The fallow will secure barley. The clover will give good beans; and the beans, if well cultivated, are sure to give good wheat." He adds, that "in answer to this, he has been told, that beans will not do in this county; that they have been tried, &c. The trials made have, he says, been broadcast, and therefore no rule whatever. They should be dibbled in double rows; that is, two furrows dibbled, a row on each, and then two or three furrows (according to soil and circumstances) should be missed, and two others dibbled, and so on; the intervals should also be well horse-hoed; the rows must be hand-hoed and weeded, and the whole kept clean like a garden. The soil is, he says, unquestionably well calculated for this crop; for similar land produces great beans in other counties, and therefore if well managed would do the same here. When beans are compared with fallow, let the consumption of the straw be considered, which yields excellent dung; let that dung be carried to the field, in addition to the quantity the land receives in the

present system; a condition absolutely necessary, if the comparison be made fairly. Let these circumstances be duly attended to, and he has little doubt what the result will be. But when random assertions are ventured, and the propriety of the recommendation questioned, he admits the fairness of all, if the proposal could be applied at once to a whole farm. But how very easy is it, says he, to try the experiment on three or four acres in perfect management not merely for one season good or bad, but to try such a quantity every year. It would then be soon ascertained, by a truly practical man, free from prejudices, whether the husbandry be really adapted to the land or not." And he advises that "in the tillage preparatory to the beans, the Middlesex management should be adopted, of ploughing while the land is dry in autumn, to throw the field into the destined form, it having been previously well gripped. Spring tillage should also be avoided, as it is pernicious on wet, stiff soils, and nothing should require to be done then except the planting of the field, when the weather would permit the work to proceed, without the land being injured."

In the district of East Lothian in Scotland, where the tillage husbandry is extensive, and in general well executed, the methods of cropping pursued by the best farmers on the different sorts of soil, are the following:

On the coast lands, where the soils are of the dry gravelly loamy description, they are under a four course shift, in this way:

- 1 Turnips, sometimes with, and sometimes without dung.
- 2 Barley, or spring wheat, with grafs-seeds.
- 3 Clover, which is generally cut for hay, or given green to farm-stock in the house, and sometimes pastured with ewes and lambs.
- 4 Wheat, or oats, if wheat was taken before, dunged upon the clover ley.

It is stated in the Report of the District, that, "after this the course again returns;" and that, "upon this description of land, the turnips are for the most part consumed upon the ground with sheep confined, by flakes, a mode by which the soil is greatly enriched. Of late years, however, an improvement has been made in the way of using turnips upon these lands, that deserves attention. In place of eating the whole upon the field where they grow, a certain proportion is drawn, and either carried home and used for cattle in the house, or given to sheep upon an adjoining stubble or grafs field: by this mode a double quantity of land is manured, and if the winter is wet, the turnip field is less injured than it would otherwise be, if the whole were consumed where they grow. The quantity drawn and carried off in this manner is from a half to a third of the crop; in some cases five or six drills are taken out; and the same number left. Taking out alternate drills is certainly a preferable mode, and is now pretty generally practised."

But that on the deeper loams with a dry bottom:

- 1 Turnips.
- 2 Barley, or spring wheat.
- 3 Pasture.
- 4 Oats.
- 5 Beans, drilled and horsehoed.
- 6 Wheat.

It is suggested, that, "this rotation requires land of the best quality. Dung is only once applied during the rotation, and is uniformly given to the turnips."

On the heavy loams on a retentive bottom:

- 1 Fallow, with dung.
- 2 Wheat.
- 3 Beans, drilled and horsehoed.

- 4 Barley.
- 5 Clover, which is dunged on the stubble.
- 6 Oats.
- 7 Beans drilled.
- 8 Wheat.

It is added, that, in "this course, the land is dunged twice, though not very heavily, a practice that is found to be very beneficial. Beans and wheat alternately are sometimes taken on such soils, but much manure is necessary, where a system of this kind is executed."

And another course on this sort of soil is:

- 1 Fallow, dunged.
- 2 Wheat with grafs-seeds.
- 3 Pasture, eaten by sheep.
- 4 Oats.
- 5 Beans, or a mixture of beans and pease drilled.
- 6 Wheat or oats.

It is stated "that the above is a rotation of six, with only one manuring, but the quantity applied is generally greater than in the foregoing rotation, and the pasture being the second after the fallow, and fed off with sheep, compensates in some degree, for the want of dung."

A rotation is sometimes followed on the best clays, such as is marked in the first class of the above.

And on thin clays,

- 1 Fallow without dung.
- 2 Oats with grafs-seeds, or if the fallow was dunged, wheat.
- 3 Pasture.
- 4 Oats.
- 5 Beans, dunged.
- 6 Wheat.

After which the fallow is repeated, and the course returns.

On the poorest of these clays, the course commonly followed, is,

- 1 Fallow, dunged.
- 2 Barley, sometimes oats, with grafs-seeds.
- 3 Clover.
- 4 Oats.

It is here suggested, that, "on the coast, a considerable portion of what was formerly *link* grounds, covered with bents and other herbage of small value, is now brought under the plough, and profitably employed in raising useful crops." That description of soil is for the most part under a rotation of four, as follows:

- 1 Turnips with dung, or sea ware.
- 2 Rye or barley, with grafs-seeds.
- 3 Clover cut for hay, or pastured.
- 4 Oats, manure on the clover ley.

It is noticed, that the "great bar to the improvement of these sandy soils, arises from the risk to which they are exposed of being blown by high winds, a circumstance which frequently happens, and by which the crops, both of turnips and barley, are often greatly injured, and sometimes entirely lost." A remedy, the writer says, "has lately been suggested and put in practice, for that evil which bids fair to be attended with benefit. The season during which the greatest mischief happens from blowing, is the latter part of the spring, and beginning of summer, and the winds by which the blowing is occasioned, are generally from the west and south; to prevent the mischief, to barley and turnips crops, it is proposed to keep barley out of the rotation, and substitute rye in its place, that the ridges of the field shall run in a direction from north to south, and that the three westernmost ridges shall be sown with rye before winter, leaving the three ridges immediately adjoining for turnips, sowing again the

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the three next ridges with rye, and so on, having alternately three ridges of each over the whole field. Where this is practised, the rye, by the time the turnips are sown, has made considerable progress, and from the circumstance of the sides of the ridges being opposed to the wind, breaks its force so much, as to prevent it from hurting the turnips. Perhaps alternate ridges of rye and turnips would answer the purpose of shelter more completely, but as some loss would arise from treading the rye in the working of the turnips, and as the latter, if the rye grew to any great height, would suffer from the want of a due proportion of the light and air, two or three ridges appear to be the proper breadth."

The above is considered as the rotation or course generally followed, on the different soils in the middle districts, and coast lands; upon the deep and well sheltered soils in the uplands, it is not materially different, except that winter wheat is seldom sown, and spring wheat not at all; for the generality of that district, however, which is a dry gravelly loam, the rotation principally followed is one of four shifts:

- 1 Turnips with dung.
- 2 Barley or oats.
- 3 Clover.
- 4 Oats.

"But upon heath lands, broken up by a two years fallow, the rotation is generally different from any of the above. Where the soil of these lands is, however, deep, the above rotation is followed; but when the situation is elevated, and the soil thin, as is often the case, the most common rotation is as under."

- 1 Oats.
- 2 Clover.
- 3 Pasture.

It is suggested, that, "in this last, the land is permitted to remain for a number of years." But that, "in some cases the system is different; the second year of the fallow, and after the lime is wrought in, turnips are sown, and eaten off with sheep, oats are sown in the spring with grass, and the land afterwards pastured. The last is unquestionably the most profitable rotation, as along with the value of the turnip crop, which in some cases may be considerable, the land is manured and has its parts consolidated, by the treading of sheep; this last is a circumstance of great importance to soils of a loose texture, as these frequently are."

And it is supposed by "some good farmers, that the rotation upon these new broken uplands, may be lengthened by taking a second crop of oats, after the clover, and again sowing down with grass-seeds. It is believed that on some of the best of these lands, that may be done with advantage; but if the soil be thin, and contain few useful principles, the experiment is dangerous, as there is a risk of rendering it useless for the future."

These details of the courses, which are pursued in cropping lands in these great grain districts, clearly prove that much remains still to be done in this way, before the greatest possible advantages can be derived from the cultivation of the soil.

Having thus explained the principles on which the business of cropping land should be conducted, the courses of crops which are best suited to different circumstances and sorts of soil, and shewn the systems of cropping, which are commonly pursued in the best corn districts of the kingdom, it may be proper to state the usual distribution of crops on farms of different descriptions. It is not however an easy matter to state with exactness the proportions of crops of different sorts, that

may be the most suitable and advantageous on farms of different sorts and sizes under the arable or other systems, as much must always depend on soil, climate, and situation in so far as markets are concerned, as well as the sort of cultivation which is practised, and other circumstances which relate to the peculiar nature of the farm itself.

It has been stated that the governing principles in this sort of arrangements should be "that the extent of land, in the state of natural and artificial grass, be fully adequate to the support of such a number of live stock of different kinds, as may be sufficient to supply such a proportion of manure as is necessary for keeping the portion of ground under grain root, green, or other crops, in the most perfect heart and order. Hence the space of ground to be conducted under grain, root green, and other arable crops, must constantly be proportioned to the quantity of manure that can be raised by the keeping of different sorts of domestic animals, while the number of the last must be regulated by the amount of the food that can be procured from the grass and green cattle crops which can be cultivated and preserved for their use during the winter season. As without considerable attention to these different circumstances, it must be impossible, it is supposed, except near large towns, where manures can be obtained at a reasonable rate, to cultivate land to the greatest advantage."

The proportionate distribution of crops on a farm of 150 acres, 60 of which were dry turnip land, and the other part a mixture of clay with gravel lying on a wet bottom; being situated on the best cultivated portion of the West-Riding of Yorkshire.

Distribution of Crops.

Wheat	-	-	30 acres.
Barley	-	-	20
Oats	-	-	14
Meadow grass	-	-	7
Red clover	-	-	14
Pasture	-	-	45
Summer fallow and turnips			20
			150

On another farm in the western part of the same district; of the extent of 80 acres, customary measure of 7840 square yards, under the grazing and dairying systems.

Annual Distribution of the Crops.

- 3½ acres of oats.
- 1½ acre of barley.
- 21 acres of meadow, cut for hay.
- 20 acres pastured with feeding cattle.
- 30 acres pastured with milch cows, young cattle and horses.

But it is suggested, that the proportion of grain is here much too small, even under such systems of management.

And upon a farm in the centre of the Riding; the soil of which is red gret and water shaken, incumbent on clay. The extent 200 statute acres, under the arable system.

Annual Distribution of the Crops.

43 acres wheat being	{	15 acres after fallow. 15 acres after clover ley. 13 acres after oats.
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The quantity of seed sown from 2½, to 3 bushels per acre.

15 acres barley, after fallow, 3½ to four bushels sown per acre.
 18 acres after oats, 5 bushels seed per acre.
 14 acres beans and pease, 3 to 4 bushels seed per acre.
 70 acres pasture and meadow.
 16 acres clover.
 31 acres summer fallow.

200

On a farm on a dry gravelly soil, the extent 78 statute acres, restricted to ploughing more than 40 acres.

Annual distribution of the Crops.

18 acres wheat.
 8 acres potatoes.
 6 acres oats.
 8 acres pease, cabbages, &c.
 27 acres pasture grafs.
 11 meadow land.

78

And on a farm where the soil was limestone, clay and moor, the extent of which was 139 statute acres.

Annual distribution of the Crops.

Wheat	-	-	23 acres.
Barley	-	-	9
Oats	-	-	23
Beans	-	-	7
Meadow	-	-	12
Fallow	-	-	20
Pasture	-	-	47

139

On a farm of the extent of 116 statute-acres, the soil limestone and clay :

Annual distribution of the Crops.

Wheat	-	-	22 acres.
Barley	-	-	9
Oats	-	-	8
Beans	-	-	5
Meadow	-	-	10
Fallow	-	-	13
Pasture	-	-	49

116

The distributions of crops on different sorts of land in the northern part of the same county, are in this way :

On a farm of 100 acres of light soil.

Annually.

	Acres.	Roods.	Perches.
In corn	40	0	0
In turnips	20	0	0
In temporary grafs ley	30	0	0
In clover	10	0	0
Total	100	0	0

And on another farm of 120 acres of heavy soil.

Annually.

	Acres.	Roods.	Perches.
In white corn	30	0	0
In Beans	10	0	0
In clover or pease	10	0	0
In green fallow crops	10	0	0
In grafs	60	0	0

Total 120 0 0

For a farm of 200 acres, managed under the convertible system, or that of alternately grain and grafs, being continued only three years under the plough, and then laid down to grafs, one, two, or a greater number of years, according to circumstances.

Distribution of the Crops.

Under different states of grafs 110 acres.
 Under fallow crops - - 30
 Under grain crops - - 60

200

Or, Annually thus ;

Under the state of old turf or sward 20 acres.
 Under different artificial grasses, as clover, lucern, saintfoin, &c. 10
 Under irrigation, or the state of preserved grafs. - 5
 Under different sorts of fallow crops 30
 Under wheat and barley after different fallow crops - 30
 Crops of different grasses 1st year 25
 Crops of ditto. 2d year 25
 Crops of ditto. 3d year 25
 Under oat and other grain crops, after breaking up the grafs - 30

200

CROPS, *Course of*, in Gardening, is the method of putting in or cultivating culinary vegetables, so as that the soil and state of the ground may be the most suitable to the nature of the plant, herb, or root, and at the same time be the best preserved from being injured by the exhaulting properties of the crops.

From the general richness of garden-ground, and much manure being constantly employed in the raising of crops on them, much less attention has perhaps been paid to the courses of cropping in the garden than in the field. It is, however, equally necessary in this case as in that and the same principles are equally applicable.

A variety of circumstances, however, conspire to prevent its being so effectually accomplished in the garden as in the farm ; as the smallness of the portions of ground generally allotted to this use, the vast number of articles which are to be grown, and their great similarity and relation to each other. It has, notwithstanding, been suggested by Mr. Nicol that they may be classed in the following manner, with much propriety and advantage.

- 1 Brocoli, cabbage, cauliflower, and favoys.
- 2 Common beans, French beans, and pease.
- 3 Carrots, beets, and parsnips.
- 4 Turnips, early potatoes, onions, leeks, shallots, &c.
- 5 Cellery, endive, lettuce, &c. &c.

It is found in practice that cellery constitutes an excellent preparation for asparagus, onions, and cauliflowers.

Turnips or potatoes are a good preparation for cabbages or greens.

Brocoli or cabbages, are a proper preparation for beans or peas.

Cauliflowers prepare well, for onions, leeks, or turnips.

Old asparagus land affords a good preparation for potatoes or carrots.

The strawberry, currant, gooseberry, and raspberry for the same.

Turnips give a suitable preparation for cellery, or endive.

And pease, when well manured for, are a good preparation for spinach, &c.

It is recommended by the writer mentioned above, that in all cases a studied course should be had recourse to, so that no crops of the same class or kind may immediately follow each other. In order to accomplish which in the most perfect manner, the garden should be divided with regularity into quarters, and numbered, a journal being kept for the purpose of entering every thing which regards the manner of cropping, manuring, trenching, digging, ridging up, and fallowing of each of them, in the manner below.

No. 1.

1793. Subtrenched after asparagus without manure for carrots.

1794. Winter fallowed, planted with early cauliflowers with moderate dunging, 2d May.

1794. Winter fallowed sowed with yellow turnips, with compost dressing, 20th July.

1795. Dug over lightly for sowing onions without manure, 8th February.

1795. Dug over deeply for planting cabbages with light dunging, 5th October.

1796. Dug over lightly for setting Charleton pease without manure, for a late crop, 20th June.

1796. Trenched three spits deep in December, winter fallowed.

1797. Dug deep, to be set with early potatoes, with moderate dunging, 20th March.

1797. Dug common depth, for German greens, without manure, 10th September.

1797. Dug common depth, intended for leeks in June next.

The other numbers of the different compartments or divisions should be managed in the same way.

It is likewise remarked that it is becoming a practice with market gardeners to crop a portion of their ground every season with some sort of grain or grass, which, besides being found highly useful for their cattle, is of vast benefit to their ground. After being laid down a year or two with some sort of the latter kind of crop, the ground is found to be capable of again growing good esculent or kitchen vegetables.

CROPPING, in *Agriculture*, the operation or process of putting different sorts of field crops into the ground. In performing this business to the most advantage, various circumstances are necessary to be taken into consideration, such as the season, and the nature, state, and preparation of the land, as well as the nature, quality, and quantity of the seed. By properly attending to all these different points of management, crops of almost all descriptions may be put into the soil, so as to succeed with much greater certainty, and in a much more perfect manner than is usual in the ordinary methods of putting them into the ground.

CROPPING, in *Gardening*, the practice of committing the various culinary and other garden crops to the soil. In this

business much attention is necessary to the season, as well as the particular habits and economy of the different sorts of plants, roots, or other kinds of crops which are to be raised; and also to the proper preparation of the ground on which they are to be grown, both in respect to the manner and depth of stirring it. There are likewise many other circumstances which require the notice of the careful gardener in this important department of his art.

CROPPING, in *Rural Economy*, a term often employed to signify the cutting off the ears or other parts of different sorts of animals, such as sheep, goats, horses, dogs, &c. either with the view of ornament or as a mark by which they may be distinguished from others of the same kind.

CROP-OUT, in *Mining*, signifies to *lasset*, *out-go*, or burst upon the surface. (See those articles.) Since the discoveries of Mr. William Smith have been promulgated respecting the stratification, a large portion of these appearances of the edges of strata, on the surface of the ground, has been denominated *ENDINGS of the strata* (which see.) These are generally on the west or north-west sides of hills and mountains, and are generally very irregular or fingered; but the dislocations, depressions, and elevations of different parts of the strata, with the denudation and excavation of other parts, have occasioned the strata frequently to crop-out, especially in mountainous districts, in every possible direction. See the above articles.

CROQUANT, *Fr.*; the name of a faction that committed great ravages towards the end of the sixteenth century in several provinces beyond the Loire. In 1593 the peasants of Perigord, Limosin, and Poitou, assembled, and appointing for themselves leaders and officers, refused to pay the imposts, over-ran the country, and gave no quarter to gentlemen who fell into their hands. They were called *croquans*, because they eat voraciously, and helped themselves plentifully wherever they went.

CROQUE-NOTE, *Fr.* in *Music*, a title given in derision by the French, to such unskilful and unfeeling musicians as are called in England mere fiddlers and scrapers.

CROQUIS, a sketch made in haste, of any design to be completed afterwards.

CRORE, in *Commerce*, the term used in the East Indies for a sum of money, equal to ten millions of rupees or 100 lacks; each lack comprehending one hundred thousand rupees, or in a round sum, 10,000*l.* sterling.

CROS, in *Geography*, a town of Egypt, according to Steph. Byz.

CROSATO, GIO. BATISTA, in *Biography*, a Venetian painter of the 18th century, who died in the year 1756. He was the tutor of Bernardino Galliani. From the design of this artist Zucchi engraved a design of God the Father and the Saviour, for the Italian translation of Milton's *Paradise Lost*. A picture, by him, representing the scourging of Christ, is in the church of St. Ermagora at Venice. Great part of his life was spent in Piedmont, where he is better known as an ornamental painter (*quadraturista*) in which line he acquired great reputation. Lanzi. Heineken.

CROSE, or *Drawing-board*, in *Heraldry*, an instrument of the coopers, used as part of their armorial enign.

CROSETTES, in *Architecture*, the returns in the corners of chambranes, or door-cales, or window-frames; called also *ears*, *elbows*, *ancones*, *prothyrides*, &c.

CROSLICIN, in *Geography*, a town of Poland, in the palatinate of Lemberg; 52 miles W.S.W. of Lemberg.

CROSIER, or *CROZIER*, (from *Crocus*, low Latin, *à similitudine crucis*; called also *Cambuta*, *Pelum*, and *Baculus Pastoralis*), the pastoral staff of archbishops, bishops, abbots, abbesses, as also of certain priors and priorities. In the testament

tament of St. Remigius, archbishop of Rheims, who died in the year of Christ 533, mention is made of an ornamented silver crozier, which he bequeathed to his cathedral church. The crozier originally was not longer than a common walking stick, and was used as such by bishops and abbots, at the same time that it was an emblem of their authority. In process of time it became longer and more ornamented, until it reached the height, richness, and exquisite workmanship which is seen in that of William of Wykeham, bishop of Winchester, bequeathed by him to his college at Oxford, called New College, and still preserved there. The crozier of ordinary bishops, and of abbots and abbesses, resembles a shepherd's crook, being curved at the upper end, and shod at the bottom with a sharp ferule, to denote its two-fold purpose, expressed in the following well-known verse:

“Curva trahit mites, pars pungit acuta rebelles.”

The crozier of an archbishop consists of a lofty, processional cross, with a single bar to it; that of a patriarch of such a cross with two bars to it; and that of the pope of a triple-barred cross.

The crozier being an ensign of spiritual jurisdiction, it was the privilege of all ecclesiastical persons, who had been canonically invested with it, to have it carried before them within the limits of their jurisdiction; that is to say, an abbot within the walls of his convent, a bishop within his diocese, a metropolitan within his province; but by no means out of it. The archbishop of Canterbury might display his crozier throughout all England, Wales, and, previously to the year 1150, throughout all Ireland; but the archbishop of York could not exhibit his on the south side of the Humber. Hence when Richard I. was crowned a second time, which ceremony took place at Winchester in the year 1194, by way of effacing the ignominy of his captivity at Trivallis, his brother Geoffrey Plantagenet, archbishop of York, finding that he was not permitted to have his crozier carried before him in the province of Canterbury, refused to be present at the coronation, as we are informed by Roger Hoveden. In conformity with this principle, abbots and abbesses were required to have a veil affixed to their croziers; which veil, however, was fashioned in the nature of a pendant, or flag, to signify that their authority was of a private nature, and confined to their respective communities. For the same reason, they were accustomed to hold the crooked head of the crozier inwards, namely, turned towards their own persons; whereas bishops held them outwards, that is to say, turned from themselves. These remarks, however trivial they may appear of themselves, are of great use in ascertaining the personage, character, and authority of many figures in our ancient sculpture and painting. M.

CROSIER, in *Astronomy*, four stars in form of a cross; by help whereof, those who sail in the southern hemisphere find the antarctic pole.

CROSNE, in *Geography*, a town of Poland, in the palatinate of Lemberg; 80 miles W.S.W. of Lemberg.

CROSNIERE, a small island in the Atlantic Ocean, on the coast of France, of about six miles in circuit, near the island of Noir Montier, which is considered as a part of the department of the Vendée. It was gained from the ocean, in 1767, by means of dikes, which on a small scale represent the famous dikes of Holland. The soil is uncommonly fertile, and well cultivated. There is but one commune or parish in the whole island.

CROSNO, **KROSNO**, or **KROSNA**, a small town of Austria, in Galicia or Austrian Poland, which carries on a good trade, chiefly in wine and other commodities of Hungary.

CROSS, **THOMAS**, in *Biography*, an English engraver of the 17th century, by whom we have, amongst others, the following portraits, executed in a poor, laboured style: Jeremiah Burroughs, 1646. James Burroughs, theol. 1648. John Richardson, bishop of Armagh, 1654. He also engraved the frontispiece to White's Rich Cabinet, 1684. Walpole. Heineken.

CROSS, —, an English painter, who flourished in the reigns of Charles I. and II. He is said to have been so excellent a copyist, that being employed by the former monarch to copy some of the finest pictures in Italy, he brought away from the church of St. Mark at Venice, a fine Madonna by Raffaele, substituting the imitation for the original. So excellent was the deception, that the cheat was not discovered until too late to regain it. This picture is now said to be in the Escorial in Spain. Pilkington.

CROSS, **CRUX**, a sort of instrument, composed of two pieces of wood, traversing and cutting each other, ordinarily at right angles. Such being the form of the cross, the body of the criminal was fastened by nailing the feet to the upright part, and the hands on each side to the transverse piece.

Pezron derives the word *crux* from the Celtic *croug*, and *croas*; though, perhaps, *croug* and *croas* might with as much justice be derived from *crux*.

The cross was used amongst the ancients as an instrument of punishment for malefactors, and particularly slaves; and was planted at several places, *in terrorem*, as our gallows, &c.

The death of the cross was, both on account of the shame and pain of it, the most dreadful of any; so that it was inflicted on the vilest criminals.

Sozomen observes, that it was Constantine who by law first abolished the punishment of the cross, which had obtained among the Romans till his time. It had also been in use among the Assyrians, Egyptians, Persians, Carthaginians, and even the Greeks. The Jews pretend that they inflicted the punishment of crucifixion upon no person whilst he was alive; but that, having first put them to death in some other way, they then fastened them to the cross either by the hands or neck. But instances occur of their frequently crucifying persons that were alive. See 2 Sam. xxi. 9.

Constantine was induced to abolish crucifixion by his respect for the cross of Christ. He would not suffer the instrument of our salvation to be thus dishonoured, and rendered an object of aversion and horror, and he thought it indecent and irreligious, that the cross should be used for the punishment of the vilest offenders, whilst he himself erected it as a trophy, and esteemed it the noblest ornament of his diadem and military standards. Although the text of this law is not preserved, the fact is asserted both by Pagan and Christian writers. (*Vid.* Aurel. Victor. and Sozomen.) Influenced by the same religious sentiment, he prohibited the breaking of the legs of criminals, which was a punishment often annexed to that of the cross, as appears from the example of the two thieves crucified with Christ. The circumstance in which Constantine's peculiar veneration for the cross originated is related by Eusebius (*De Vita Const. lib. i. c. 27, 28, 29, 30.*) in the following manner.—This writer represents the emperor as deliberating, and determining what God he should worship when he was undertaking the war with Maxentius, or, however, before he had finished it; which was begun in 311, when Constantine was considerably above 30 years of age. Weighing, says Eusebius, in his mind the misfortunes of those who had worshipped idols, he made choice of the Christian religion; and considering

dering with himself that he wanted some better assistance than military forces, he sought for a God that might be his helper. In consequence of his deliberation on this subject, he was convinced, that it was the utmost folly so far to trifle as to pay honour to such gods as were mere nullities; and he therefore resolved to worship only the God of his father. Eusebius proceeds in the following words: "He therefore called upon this God in his prayers, earnestly intreating and beseeching him, that he would make himself known to him, and afford him his powerful aid in the difficult affairs before him. Whilst the emperor was putting up these earnest prayers and supplications, a divine sign (*θεοσημεία*) of a most wonderful nature appeared; which thing, possibly, if related by another, would not be easily credited. But the victorious emperor himself having told it to us, who wrote this history a long time after, when we had the honour of his acquaintance and conversation, and having likewise confirmed it with an oath, who can refuse his assent to it, especially when following events have borne testimony to the truth of it? He said then, that about noon, when the day was declining, he saw with his own eyes in the heavens, the trophy of the cross, placed above the sun, consisting of light, with an inscription annexed, *τῷ ὄντι*. BY THIS CONQUER; that at the sight of it, astonishment seized him and his whole army, which then followed him in a certain march, and beheld that wonderful sight." "In the mean time," as he said, "he began to doubt with himself, what the meaning of this should be; but whilst he was revolving in his mind, and continued meditating upon it, at length night came on. As he slept, the Christ of God appeared to him with that sign which had appeared in the heavens; and commanded him to make a standard resembling the sign, which he had seen in the heavens, and to use it as a defence, in the battle with his enemies."—"As soon as it was day, he arose, and communicated this wonderful thing to his friends. And then sending for such as worked in gold and precious stones, he seated himself in the midst of them, and gave them a description of the sign, and commanded them to make one like it in gold and precious stones, which we have also seen." Eusebius afterwards describes the standard. In a crown of gold at the top of the cross was a figure, consisting of the two first letters of the name of Christ, according to the Greek orthography.

This figure on some medals, is formed thus , in others

thus , and the standard thus marked is called *labarum*, which see. When the troops in any part of the army began to give way, the emperor caused the standard with the cross to be conveyed thither; and his faith, says Eusebius, was rewarded with victory, which began on that side where the greatest danger was apprehended.

The appearance of the luminous cross in the heavens is altogether denied by some, who call it a fiction, a stratagem, a political device of Constantine, to animate his soldiers, and to engage the Christians firmly on his side. By some it was regarded as a pious fraud. This opinion, as Fabricius assures us (*Apud Bib. Græc. l. v. c. 3. t. vi. p. 8., &c.*) has been fully considered and confuted by Jo. Chr. Wolfius. By others, more generally, the cross, which is said to have been seen by Constantine in the heavens, is reckoned not only a reality, but a miracle. Fabricius (*ubi supra*) allows and contends for the reality of it, but does not think it properly miraculous. He suggests that it was a solar halo, which is a well known phenomenon; and in order to account for the inscription, *τῷ ὄντι*, he suggests,

that *ὄντι*, in Eusebius's relation, means a *picture*, as well as a *writing*, and that *λέγειν*, when applied to a picture or image, means to *denote* or *imply*, and that the words of Constantine and Eusebius may be thus interpreted: to the cross was adjoined a picture or image, intimating that by this he should conquer; which image was a lucid crown, a representation or symbol of victory. In confirmation of this solution, it has been alleged, that Eusebius, by not using the words *σοῦμα*, or *ἑσθημεντα*, nor mentioning in what language it was written, seems to speak rather of an emblem or picture, than of a writing. Besides, in the standard which Constantine ordered to be made in form of a cross, in memory of this omen, he placed a crown of gold and jewels on the top of it, and a cypher denoting the name of Christ, but not the words *τῷ ὄντι*. We shall here subjoin some pertinent and judicious remarks that have been made on this history of Eusebius by Dr. Lardner. (*Works, vol. iv. p. 152, &c.*) 1. This relation is delivered by Eusebius upon the sole credit of Constantine; whereas a thing of so public a nature could not have rested upon his credit and authority only, if it had been true. Other witnesses might have been called to vouch for the truth of an event, so surprising, and so recent; *i. e.* 20 years before Eusebius wrote the life of Constantine; and the historian, from dutiful affection for the emperor, and from a just concern for his own honour, would not have failed to add something to this purpose. 2. The oath or oaths of Constantine upon this occasion, rather bring his relation into suspicion. 3. Eusebius renders this whole account suspicious, by not mentioning the place of this wonderful sight; and this defect renders it probable, in Dr. Lardner's judgment, that Eusebius himself did not believe this story, nor intend to vouch for the truth of it. 4. There are other things concerning the standard related by Eusebius, which he also had from Constantine, and which are very unlikely, if not altogether incredible. Wherever the standard was, says the historian, the enemies fled; and this is not improbable, because it might animate Constantine's soldiers, and terrify the enemy. But it is added, that the salutary trophy was a safeguard to him who bore it, and there never was any one wounded in this service. This relation, for which Eusebius does not make himself answerable, surpasses all credible accounts of miracles; that when many darts were thrown, none should strike the bearer, nor yet light upon the upper part of the standard, where were the cross and the motto, but only, and always, upon the narrow circumference of the spear, or pole of the standard. 5. Lactantius, or the author of the book "Of the deaths of Persecutors," who wrote a few years after this appearance in the heavens is supposed to have happened, says nothing of it, but only mentions Constantine's dream or vision in his sleep. But the truth of this vision rests solely upon the emperor's own word; and if the appearance of the cross in the heavens be denied, which Constantine confirmed to Eusebius with an oath, the credit of the emperor, as to the whole matter, is so weakened, that nothing concerning it can be taken upon the authority of his testimony only. It is further added by Lardner, that since several ecclesiastical historians, who wrote after Eusebius, particularly Rufinus and Sozomen, insist not upon the appearance of the cross in the heavens, there were at that time Christians, as well as others, who either were totally ignorant of it, or else did not credit the account, as related by Eusebius from Constantine. Indeed, it does not seem reasonable to believe the relation of any one man, concerning a public appearance, which is attested by no others; nor did Eusebius himself believe it, much as Constantine endeavoured to impose upon his learned friend. In order to account for the difference in

the relation of this fight in the heavens, and the silence of historians respecting it, Dr. Lardner conjectures, that when Constantine first informed people of the reason that induced him to use the sign of the cross in his armies, he alleged nothing but a dream; but in the latter part of his life, when he became acquainted with Eusebius, he added the other particular of a luminous cross seen somewhere by him and his army in the day-time; and the emperor having related this in the most solemn manner, Eusebius thought himself obliged to mention it. But the first account had been so long and so often told, that it was generally known, and the only one that was so known. Whence it came to pass, that historians a good while afterwards related the vision in the dream as the original cause of Constantine's using the cross; that being the common and prevailing tradition concerning it.

As to the time when the appearance of the cross in the heavens and the dream of Constantine are said to have happened, authors are not agreed; but these events have generally been referred to the 26th of October, A. D. 312. But this opinion is far from being satisfactory, as it is liable to many objections. Dr. Lardner supposes, that the sign of the cross began to be made use of by Constantine in his armies on occasion of his last battle with Maxentius; some short time at least before this battle; and the day of it, the thought of employing this sign must have come into Constantine's mind; whether by divine revelation and admonition, or his own politic contrivance, let the inquisitive judge, says Lardner, after mature consideration. Constantine was a politician as well as a Christian, and he might have adopted the standard of the cross, and the mark of it upon the shields of his soldiers, with a view of reconciling them to his change of religion, and also as a means of success in his designs, and of victory over his enemies.

After this digression, we shall return to the more immediate subject of this article. As to crucifixion, or the manner wherein the punishment of the cross was effected, the critics, both ancient and modern, are exceedingly divided; the points in dispute are, whether the criminal was fastened with three nails, or with four; whether the feet were immediately fastened to the cross, or whether they rested on a little piece of wood, in manner of a step, or rest, called *σκαμνίον*; whether the cross was planted in the earth before the person was nailed on, fastening him afterwards by means of a scaffold raised to the height of the place where the feet were to be nailed; or whether he was nailed before the cross was raised or planted, as the painters represent it: or lastly, whether the patient was fastened quite naked, or covered: questions that have all been occasioned by the crucifixion of Jesus Christ.

In reference to this event, we may here add, that our Saviour was scourged before he was delivered to be crucified (Matth. xxvii. 26. Mark, xv. 15.), agreeably to the usual custom among the Romans, who scourged persons condemned to capital punishment before execution. He also bore his cross. (John, xix. 16, 17.) It was the constant practice among the Romans for criminals to carry their own cross. Thus Plutarch (*De iis qui ferro puniuntur*), alleges this circumstance as an illustration of the misery of vice; "that every kind of wickedness produces its own particular torment, just as every malefactor, when he is brought forth to execution, carries his own cross." We are also told by the evangelist, that our Lord was crucified without the city.

This is conformable to the Jewish law, and to examples mentioned in the Old Testament. Among the Romans also this custom was very common, at least in the provinces. The robbers at Ephesus, mentioned by Petronius Arbitr

(Satyr. c. 71.), were crucified by order of the governor of the province, without the city. This was the custom likewise in Sicily, as appears from Cicero (in *Verr. l. x. c. 66.*) Persons devoted to this kind of death often lingered for a long while before their pain terminated in dissolution. Sometimes they remained suspended till they died of hunger; and in some cases they were suffered to remain on the cross till their bodies were devoured by birds of prey; nor were their relations allowed to take them down and bury them. The law of Moses, however, forbade the bodies to remain on the cross after sun-set. See John, xix. 31, 32, 33.

Cross, in *Antiquity*, was under one form or other of it, a kind of monument of art, which very long and very generally subsisted, which was constructed of various materials, but most commonly of stone, and which was intended to answer a variety of purposes, civil and religious. Under the article *CROMLECH*, we have already mentioned several stone structures, which were erected in the British islands by the Druids, Saxons, or Danes, and which served as temples or altars, or burying-places. The stones that formed them were sometimes placed across one another, probably more from necessity or convenience, than from any particular view to the figure of a cross. After the introduction of Christianity, and more especially after the age of Constantine, the cross became an object of very general veneration, and traces of it are discernible in many of our churches and monuments, as well as in our civil and religious customs and ceremonies. Those monuments of stone, which served as instruments of Druidical superstition before the plantation of the gospel in the British isles, were afterwards appropriated to the use of Christian memorials, by being formed in the figure of a cross, or marked with this emblem of sanctity and object of veneration. Structures of the kind now mentioned were appropriated to various purposes; and we find them subsisting in several places, as memorials of the demarcation or boundary of property, parishes, and sanctuaries; as sepulchral monuments; as public records of battles, murder, and other disastrous events; as places of public prayer, preaching, and proclamation: and others were placed by the road-side, in market-places, at the junction of three or four streets or roads, and on the spot where the corpse of any person of rank and eminence was set down for the rest of the attendants, in its way to interment; so that "a transfentibus pro ejus animo deprecetur." It was a common practice for mendicants to station themselves near some of these crosses, and beg alms in the name of Jesus; and to this custom the provincial proverb, still retained in the north of England, seems to allude, when applied to a person very urgent in his intreaties; "He begs like a cripple at a cross." Crosses were also in former times erected on the tops of houses, by which tenants pretended to claim the privileges of the templars-hospitallers, of defending themselves against their rightful lords. This was condemned by the statute Will. II. c. 37. These stone-crosses were anciently incitements to superstition, and even objects of worship. See *Exaltation of the Cross, infra.*

Such was the veneration with which crosses were formerly regarded, that when St. Augustine first came to preach the Christian faith to the Saxons, he had a cross borne before him with a banner, on which was the image of our Saviour. Crosses were also erected by many Christian kings, before a battle, or great enterprize, with prayers and supplications, for the assistance of Almighty God. Oswald caused a cross of wood to be erected before he fought with Cadwallo, holding it till the earth was rammed in round about it, while all his soldiers kneeled down devoutly. Many instances occur of crosses that were placed to mark the bound-

aries of districts, of church-property, and of sanctuary. Of the former class are "Stump-crosses," being the boundary-stone between Frisby and Ashfordby, in the county of Leicester; another of the same name on the summit of a high hill at Townley, in the parish of Whalley, and county of Lancaster; the shire cross-stone, on the mountain called Wry-nose, near the river Dudding, dividing Cumberland from Westmoreland; the cross yet remaining on Stainmore, which is the boundary-stone between Yorkshire and Cumberland; and the stone-cross, called "Mugdrum cross," near Lundorfs in Fifeshire, which, according to Camden, marked the boundary between the districts of Fife and Strathern, which was also a place of sanctuary.

At Ripon, in Yorkshire, the boundaries of sanctuary of the collegiate church were distinguished by crosses. Among the monumental crosses, those at Penrith church-yard, in Cumberland, are somewhat singular and curious. Such are those in the church-yard of Glames in Scotland, and that in the church-yard of Bewcastle in Cumberland, the latter of which is ascribed by many antiquarians to the Danes. These monumental stones are very numerous in Wales, Scotland, Ireland, and the north of England. There were two of this kind in the monks' cemetery at Glastonbury; and such was also the monument of St. Dunstan at Canterbury. Crosses were usually erected in the way leading to parochial churches and cemeteries. Cornwall abounds with stone-crosses. In church-yards, by the sides of roads, and on the open downs, they remain solitary and neglected, though among the lower classes of the people a sort of superstitious reverence is still paid to these monuments. The preaching-cross, stone-pulpit, or oratory, was probably first erected for the purpose of sheltering and accommodating the minister when he preached to a large concourse of people in the open air, or for his convenience in reading the funeral service. Of this kind are the crosses near the monastic house of the Black-friars in the city of Hereford; that in the church-yard of Iron-Aeton in Gloucestershire; that at Holbeach in Lincolnshire; and that on the south side of the abbey at Shrewsbury, commonly called "St. Winifrid's pulpit." But the most noted of this class was "St. Paul's cross" in London, which was probably at first of the monumental kind. This was the most celebrated place in London for public sermons, though it was often abused by the agents of the predominant party. This cross appears to have been standing at the time when Dugdale wrote his history of St. Paul's. There was another public preaching cross in Spitalfields, near London, where the lord-mayor, and principal officers of the city, &c. regularly attended to hear sermons in Easter-week. Those discourses, called the Spital-sermons, originated at this cross; but they are now preached at St. Bride's.

Crosses not only marked civil and ecclesiastical limits, but probably served for stations, when the bounds were visited in processions; a station denoting a church-oratory, or other resting place, where a prayer was said or a short verse sung. In the isle of Iona were 360 crosses, of which one only now remains. Crosses also on the road, or without the limits of the cemetery, seem to have been endowed with a privilege of sanctuary.

The market-crosses are of various shapes and sizes. Their general design was to excite public homage to the religion of Christ crucified, and to inspire men with a sense of morality and piety amidst the ordinary transactions of life. In almost every town that had an abbey, or any other religious foundation, there was one of these structures. At most markets and fairs it was then, as it is now, customary to pay certain tolls on articles that were sold. Many of these tolls belonged to monasteries, and in populous places they must have produced considerable revenues. To promote these, as well

the doctrines of their religion, the monks frequently harangued the populace from these crosses; and it is reasonable to suppose that they strongly urged the necessity of a strict adherence to religion, honesty, and industry. Previously to the dissolution of the monasteries, there was hardly a market town in England without one or more of these structures; and many of them still remain, exhibiting beautiful specimens of the architecture and sculpture of the times. To this class we may refer the "White Friar's cross" in the road, about one mile W. of Hertford; the crosses at Coventry, Gloucester, Cheddar, Malmesbury, Chichester, Stourhead in Wiltshire removed from Bristol, Winchester, Leighton-Buzzard in Bedfordshire, and Glastonbury. Crosses of memorial are those which were erected in places where the bodies of eminent persons halted in their way to interment. Of these a series formerly stood by the side of the road which communicated between Paris and St. Denis, where the kings of France were usually interred. The most memorable and interesting objects of this kind were those which king Edward I. of England erected at the different stages where the corpse of queen Eleanor rested, in its progress from Nottinghamshire to London. Mr. Gough (*Vetusta Monumenta*, vol. iii.) states, that there were originally 15 of these elegant structures; but only three are now remaining, which, by their peculiar beauty, as specimens of architecture and productions of art, serve to excite regret at the destruction of the others. Historians, however, differ, not only as to the place and time of queen Eleanor's death, but also concerning the number of crosses erected. The most probable account is that she died at Hereby in the county of Nottingham, in November, A. D. 1290. At the place, probably near a religious house, where the corpse halted for a night, the king afterwards ordered a sumptuous cross to be erected. The first of the three above-mentioned is the *Cross at Geddington*, about four miles from Kettering, in Northamptonshire, which is of a triangular shape, elevated on eight steps, and divided into three compartments; the first, or lower one, is solid, covered with ornamental sculpture, each face divided into six pannels, attached to which are six shields, charged with the arms of England, Castile, Leon, and Ponthien. Above this is an embattled turret, from which rise six pillars, supporting as many decorated canopies. Beneath these are placed three statues of the queen, disposed in so absurd a manner, that the pillars at the angles directly intersect the front of each figure. The second is the *Queen's cross* near Northampton, the most perfect of the three, and very similar in shape and ornaments to that at Waltham, though the latter is of an hexangular form, and the former is octangular. Standing on eight steps, in an open country, and on elevated ground, it assumes a very imposing appearance. Like the others, it is divided into three stories, the lower of which has eight faces, separated by buttresses at the angles. Each face is ornamented with a pointed arch, having a central mullion, with tracery, and the whole crowned with a purfled pediment. Two shields are also attached to each face, charged with the arms of England and Ponthieu singly, and those of Castile and Leon quarterly. A carved book is also affixed to four of the sides. On the western face has been inserted the arms of Great Britain, in a garter, under a crown, beneath which is a Latin inscription; and on another tablet is another inscription, the former importing that it was repaired in the year 1713, and the latter in 1762.

The third is the *Cross at Waltham* in Hertfordshire, which, though more dilapidated than either of the former, is more enriched in its architecture, and more elegant in its sculpture. This formerly stood on steps, but the ground hav-

ing been raised round it, the steps are covered and it appears shorter than the others. This has six faces. For a further account of these crosses, illustrated with appropriate and excellent engravings, see the valuable work of Mr. Britton, entitled "Architectural Antiquities of Great Britain," parts iv. and v.

Crosses, &c. are forbid to be brought into England, by 13 Eliz. c. 2, on pain of a *præmunire*, &c.

Cross, *Invention of the, inventio crucis*, an ancient feast, solemnized on the third of May, in memory of St. Helena's (the mother of Constantine) finding the true cross of Christ deep in the ground, on mount Calvary; where she erected a church for the preservation of part of it: the rest being brought to Rome, and reposed in the church of the Holy Cross of Jerusalem.

Theodoret mentions the finding of three crosses, that of Jesus Christ, and those of the two thieves; and that they distinguished between them by means of a sick woman, who was immediately healed by touching the true cross. The place is said to have been pointed out to her by St. Quiriacus, then a Jew, afterwards converted and canonized.

Nothing, says Tillemont, is more certain than this discovery of the true cross in the days of Constantine; for it is attested by Rufinus, Sulpitius Severus, Theodoret, Socrates, Sozomen, Ambrose, Paulinus, and Chrysostom. The account he gives of this wonderful discovery is as follows: "When St. Helena, the mother of Constantine, was arrived at Jerusalem, and had begun to visit the sacred places, the Holy Ghost inflamed her with a desire to find the wood of the cross. But no person had ever seen it, or could tell where it had been hid. She then inquired for the place where Christ was crucified, and found it out by the help of the Jews and Christians; or, as Rufinus says, by some revelation; and being moved by the Holy Spirit, she ordered the buildings to be pulled down, and the rubbish to be removed. The faith of this female saint was recompensed beyond expectation; and upon digging very deep, they found the holy sepulchre, and near it three crosses, with the title which had been affixed to the cross of Christ, and the nails which had pierced his sacred body. But a difficulty still remained, which was to distinguish the cross of Christ. St. Macarius, bishop of Jerusalem, proposed the method. He was a prelate illustrious for his wisdom, truly worthy of God, and had just overthrown the heresy of Arius at the great council of Nice. This holy man, knowing that one of the principal ladies of the city lay extremely ill, told Helena, that they must carry the three crosses to the sick person, and beg of God that he would cure her by the application of the true cross. The empress, and all the people being present, he touched the woman with two of the crosses ineffectually; but as soon as he had made use of the third, she arose in perfect health, and stronger than she had ever been. It is believed, says Sozomen, that they applied the cross to a dead body, which instantly revived. St. Paulinus and St. Sulpitius Severus mention only this last miracle. Helena, full of joy, adored not the wood itself, says St. Ambrose, which would have been a Pagan folly, but the king of heaven who suffered upon it. She took part of this treasure to carry to her son, and inclosing the rest in a silver box, she committed it to the bishop of Jerusalem. It was carefully kept in the church, which was built there, and the bishop alone had the power to give little pieces of it, which were considered as a singular favour and blessing. St. Paulinus relates a *very singular thing* concerning that part of the cross which was at Jerusalem. This cross, says he, having a vital virtue in an insensible and inanimate substance, hath yielded, and continues to yield, almost daily, its precious wood to the desires of an infinite number of

persons, without suffering any diminution, continuing all the while as if it had been untouched. It permits itself every day to be divided into several parts, and yet remains exposed entire to the veneration of the people. St. Cyril of Jerusalem says only, that the pieces of the cross were brought away from Jerusalem, and were spread all over the earth twenty-five years after." (H. E. vii. 5.) In the review of this relation a difficulty occurs, whether the discovery of the cross was a fiction formed some years after the death of Helena and of Constantine, or whether Helena really found a cross. Upon the whole, it seems most probable, that the story was invented by the Christians at Jerusalem, after the emperor and his mother were dead. The discovery in the time of Constantine rests principally upon the authority of Cyril of Jerusalem, the only witness who lived at that time, and who speaks of no miracles attending the discovery; and the question is, whether the epistle of Cyril, which mentions it, be genuine or spurious, or interpolated; and also whether Cyril, supposing it genuine, made up that part of the story himself, and dated the discovery at too early a period. If Helena found a cross, it is impossible now to know how the fraud was conducted, on the part of those who were actors, both hid and finders, in this transaction. Eusebius, who lived at the time, and was bishop of Cæsarea, in the neighbourhood, says not a word of the cross, though he relates the discovery of the sepulchre of Christ, and mentions the magnificent church which was erected there, and names Macarius as the person to whom the care of the building was committed. (Vit. Const. iii. 25, &c.) It is, therefore, to be concluded, either that he knew nothing, or believed nothing of it. One would hope that the letter ascribed to St. Cyril is spurious or interpolated. Helena was fourscore years old when she took this journey to Jerusalem; and it is more probable that she should have been imposed upon, than that she should have had any share in the contrivance. After her death she was faint and highly honoured: her body is said to be in an abbey in France, and also at Rome; but there is no great inconvenience in supposing it to be in two places at once. The multiplication of the cross attested by Paulinus, leads us to this opinion. (See Tillemont, H. E. vii. 18.) The ecclesiastics of Jerusalem, at whatever time they contrived the discovery of the cross, knew their own interest very well. It must have drawn a swarm of pious vagrants to their city, and have brought in great revenues to the church and to the bishop, if they gave only *6d.* a-piece, to see the box in which the cross was locked up. The finding of the cross hath also been ascribed to one Judas, a Jew, by Gregory of Tours. See the remarks of J. Basnage, *Hist. des Juifs*, vi. 14. § 10. Jortin's Remarks on E. H. vol. iii. Gibbon's *Hist.* vol. iv.

Cross, *Exaltation of the*, an ancient feast, held on the 14th of September, in memory of this, that Heraclius restored to mount Calvary the true cross in 628, which had been carried off fourteen years before, by Chosroes, king of Persia, upon his taking Jerusalem from the emperor Phocas.

The adoration of the cross appears to have been practised in the ancient church, in as much as the heathens, particularly Julian, reproach the primitive Christians with it. And we do not find that their apologists disclaimed the charge. Mornay, indeed, asserted, that this had been done by St. Cyril, but could not support his allegation at the conference of Fontainebleau. St. Helena is said to have reduced the adoration of the cross to its just principle, since she adored in the wood, not the wood itself, which had been direct idolatry and heathenism, but him who had been nailed to this wood. With such modifications, some protestants have been induced to admit the adoration of the

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crosses. John Hufs allowed of the phrase, provided it were expressly added, that the adoration was relative to the person of Christ. The Roman catholics have been charged, in our opinion unjustly, with the adoration of the cross. To this purpose, it has been said, that Imbert, the good prior of Gascony, was severely prosecuted in 1683, for telling the people, that in the ceremony of adoring the cross, practised in that church on Good Friday, they were not to adore the wood, but Christ who was crucified on it: the curate of the parish told them the contrary: it was the wood! the wood! they were to adore. Imbert replied, it was Christ, not the wood: for which, it is said, that he was cited before the archbishop of Bourdeaux, suspended from his functions, and even threatened with chains and perpetual imprisonment. It little availed him to cite the bishop of Meaux's distinction; it was answered, that the church allowed it not. This story we have cited, as it has been related by various authors, in order to have an opportunity of contradicting the allegation implied in it, considered as a charge against the Catholics. We are well assured by a Catholic priest, of unquestionable veracity and honour, that as Bossuet's exposition was solemnly approved of at its first publication, by the whole prelatial body of France, and by the reigning pontiff, Innocent XI., so it will be formally subscribed to, should the occasion require it, by every Catholic bishop in the three kingdoms, and by Pius VII. himself. But it is unnecessary to add any thing further on this subject, besides appealing to the very words of the council of Trent on the subject in question; *viz.* of a council from the doctrinal decrees of which the Catholics are never permitted to swerve, and which was specially held to determine the sense of their church upon all modern controversies. "Imagines porro Christi, Deiparæ Virginis, & aliorum sanctorum in templis præsertim habendas, & retinendas, eisque debitum honorem, & venerationem impertiendam: non quod credatur inesse aliqua in iis divinitas vel virtus propter quam sint colendæ; vel quod ab eis sit aliquid petendum; vel quod fiducia in imaginibus sit figenda: velut olim fiebat à gentibus quæ in idolis spem suam collocabant: sed quoniam honores quæ eis exhibetur refertur ad prototypa quæ illæ representant: ita ut per imagines quas oculamur, & coram quibus caput aperimus & procumbimus Christum adoremus & sanctos, quorum illæ similitudinem gerunt, veneremur." Concil. Trid. sess. xxiv. cap. 21.

CROSS-bearer, port-crois, cruciger, in the Romish Church, the chaplain of an archbishop, or a primate, who bears a cross before him on solemn occasions.

The pope has the cross borne before him every where; a patriarch any where out of Rome: and primates, metropolitans, and those who have a right to the pallium, throughout their respective jurisdictions.

Gregory XI. forbid all patriarchs and prelates to have it borne in presence of cardinals. A prelate bears a single cross, a patriarch a double cross, and the pope a triple one on their arms.

CROSS-bearers, also denote certain officers in the Inquisition, who make a vow before the inquisitors, or their vicars, to defend the catholic faith, though with the loss of fortune and life. Their business is to provide the inquisitors with necessaries. They were formerly of great use; but in process of time, some of their constitutions were changed, and they were called, of the penance of St. Dominic. Limborch's Hist. Inq. by Chandler, ch. x. See **FAMILIARS,** and **INQUISITION.** See also **ALBIGENSES.**

CROSS-birth, in *Midwifery.* When in labour, the arm, shoulder, or any other part of the child than the head, presents to the mouth of the uterus, it is usually called a cross-birth.

CROSS, pectoral, is a cross of gold or silver, or other precious materials, often enriched with diamonds, which the bishops, archbishops, &c. and regular abbesses, wear hanging from the neck.

CROSS of Jesus Christ, order of, was instituted, in 1217, by St. Dominic, and confirmed by pope Innocent VI. in 1220. The badge of this order was a cross potence per cross counter-changed, argent and sable, in pale the letter P, surmounted with the letter X, or.

CROSS, order of the starry, or Croisade, an order for ladies instituted in 1668, by the empress Eleonora de Gonzaga, wife of the emperor Leopold; on occasion of the miraculous recovery of a little golden cross, wherein were enclosed two pieces of the true cross, out of the ashes of part of the palace. It seems the fire had burnt the case wherein it was inclosed, and melted the crystal; yet the wood remained untouched. The ensign of the order is a medal of gold chased and pierced; in the centre the imperial eagle; over all a cross surmounted with the letters I. H. S., and a small cross over the letter H, with a motto, "*Salus et Gloria:*" worn pendent at the breast by a small black ribbon.

CROSS of St. Louis, a French order, which was purely of a military nature. It was instituted by Louis XIV. in addition to that of *Christian Charity*, which had been founded by Henry III., king of France, in favour of maimed officers and soldiers in 1693. This order consisted of eight great crosses and 24 commanders, besides the king, who was grand master, the dauphin always invested with it, the treasurer, recorder, and usher. Land and sea officers wore it promiscuously. The cross consisted of eight points enamelled, white, edged with gold, having in the angles four *flurs-de-lis*, and on the middle a circle, within which is the image of St. Louis in armour, holding in his right hand a crown of laurel, and in his left a crown of thorns, &c. The cross of the knights was attached to the button hole of the coat by means of a small ribbon crimson coloured and watered.

On one side was this inscription, *Ludovicus magnus instituit 1693;* and on the reverse there was a blazing sword with the following words, *Bellicæ virtutis præmium.*

CROSS, Maids of the, a community of young women instituted in 1265, at Roye, in Picardy, and since dispersed to Paris and other towns. They instruct young persons of their own sex; some take the three vows of poverty, chastity, and obedience; others retain their liberty. They are under the direction of a superior.

CROSS, judgment of the, a custom in France and other parts of Europe, in the middle ages, of giving judgment in favour of one of two contending parties, who held his arms for the longest time lifted up to a cross.

Charlemagne ordered, that if any difference should arise between his children, they should be terminated by the judgment of the cross. In a placitum or trial in the presence of this emperor, we have such an account of it as sufficiently shews the imperfect manner in which justice was administered even during his reign. In the year 775, a contest arose between the bishop of Paris and the abbot of St. Denis, concerning the property of a small abbey. Each of them exhibited deeds and records in order to prove the right to be in them. Instead of trying the authenticity, or considering the import of these, the point was referred to the *judicium crucis*, in the manner stated in the sequel of this article. The person employed by the bishop on this occasion, had less strength, or less spirit than his adversary, and the question was decided in favour of the abbot. If a prince so enlightened as Charlemagne countenanced such an absurd mode of decision, it is no wonder that other monarchs should tolerate it so long. Lewis the Pious confined this judgment

judgment to ecclesiastical affairs: his son Lotharius abolished it in all cases; and he abolished even the trial by cold water. When we consider how much the cross was an object of superstitious veneration at the period to which we now refer, we cannot be surprised that it was employed as an ordeal. It was used to this purpose in a variety of ways. In criminal trials, the judgment of the cross was commonly thus conducted: When the prisoner had declared his innocence upon oath, and appealed to the judgment of the cross, two sticks were prepared exactly like one another; the figure of the cross was cut on one of these sticks, and nothing on the other; each of them was then wrapped up in a quantity of fine white wool, and laid on the altar, or on the relics of the saints; after which, a solemn prayer was put up to God, that he would be pleased to discover, by evident signs, whether the prisoner was innocent or guilty. These solemnities being finished, a priest approached the altar, and took up one of the sticks, which was uncovered with much anxiety. If it was the stick marked with the cross, the prisoner was pronounced innocent: if it was the other, he was declared guilty. (Spelm. Gloss.) When the judgment of the cross was appealed to in civil causes, the trial was conducted in this manner: the judges, parties, and all concerned, being assembled in a church, each of the parties chose a priest, the youngest and stoutest that he could find, to be his representative in the trial. These representatives were then placed one on each side of some famous crucifix; and at a signal given, they both at once stretched their arms at full length, so as to form a cross with their body. In this painful posture they remained while divine service was performing; and the party whose representative dropped his arm first, lost the cause. (Murator. Antiqu. t. 111.)

CROSS, in *Baptism*. In the administration of this Christian ordinance, a practice, though not enjoined by any express command, or sanctioned by any known example in Scripture, was adopted at an early period, of signing the forehead of the person baptized with the sign of the cross. The use of the cross indeed was very frequent in the primitive times. Such was the respect paid to it, that it formed, in one mode or other, a distinguishing part of their civil and religious ceremonies. The first Christian writer who mentions it in connection with baptism, is Tertullian, after the middle of the 2d century; and he also says (De Cov. Mil. c. 2.) "that at every setting out, or entry upon business, whenever we come in, or go out from, any place, when we dress for a journey, when we go into a bath, when we go to meat, when the candles are brought in, when we lie down or sit down, and whatever business we have, we make on our foreheads the sign of the cross:" and speaking of baptism, in his treatise, ("De Carn. Resur.") he says, "the flesh is signed, that the soul may be fortified." This signation was performed with the oil used in the attendant ceremony of unction, with which the priest touched the head or forehead in the form of a cross. Tertullian, however, on other occasions, describes the custom of baptizing without mentioning signing with the cross. This father also speaks (De Præscript. adv. Hæret.) of priests, who, imitating the service of God in the idolatrous rites of Mithras, baptized some as his believing and faithful servants, and signed them in their foreheads as his soldiers. Cyprian, who lived in the third century, observes (De Unit. Eccles. § 16.) that this sign was made in the forehead; and hence (De Lapsis, § 1.) he calls a Christian's forehead, "a signed forehead." In succeeding ages, the same practice of signing with the sign of the cross is mentioned as used whenever a person was baptized; and it was done, as the

form of baptism in the service of the church of England expresses it, "in token that hereafter he shall not be ashamed to confess the faith of Christ crucified, and manfully to fight under his banner against sin, the world, and the devil, and to continue Christ's faithful soldier and servant unto his life's end." It has been said, however, that this ceremony does not appear to have been used in baptism till the latter end of the fourth or fifth century. See BAPTISM. To this ceremony, as well as some others, enjoined by the service of the church, and by the injunctions of queen Elizabeth, the puritans scrupled conformity, A. D. 1567; alleging that the sign of the cross in baptism is no part of the institution as recorded in Scripture; and that, although it was usual for Christians, in the earlier ages, to cross themselves, or make a cross in the air upon some occasions, yet there is no express mention of its being used in baptism till about the 5th century. They also alleged, that it had been abused to superstition by the church of Rome, and regarded with such veneration by some protestants, that baptism itself was thought to be imperfect without it; and that for those reasons it ought to be laid aside. On occasion of a debate upon the cross in baptism in the upper house of convocation, A. D. 1603, Bancroft, bishop of London, and some others warmly vindicated it; but Dr. Rudd, bishop of St. David's, pleaded, with singular candour and considerable eloquence, but without much effect, for charity and moderation. He was answered by other prelates, and forbidden by the president to reply. The puritans, and also the protestant dissenters of modern times, object to the imposition of any rite, the observance of which, as a religious act, is not authorized by precept or pattern in the Christian code of their faith and practice.

CROSS, in *Botany*, is used to express the arrangement of the petals of certain flowers; called *planta flore cruciformi*. See CRUCIFORM.

CROSS, in *Coins*, a name given to the face, or right side, the other being called the pile, or reverse. It has been a common error that the reverse was meant by the cross, because at this time with us marked with figures disposed in that form; but the stamping of the head of the prince in these kingdoms, on the right side of the coin, was preceded by a general custom of striking on that part the figure of a cross, while the other, called the pile, contained the arms, or some other device.

CROSS, in *Dialling*. See DIAL.

CROSS, in *Heraldry*, is defined by Guillim, an ordinary composed of fourfold lines; whereof two are perpendicular, and the other two transverse; for so we must conceive of them, though they be not drawn throughout, but meet by couples, in four right angles, near the fess-point of the escutcheon. See ORDINARY.

The content of a cross is not always the same: for when it is not charged, cantoned, nor accompanied, it has only the fifth part of the field; but if it be charged, it must contain the third part thereof.

This bearing was first bestowed on such as had performed, or at least undertaken, some service for Christ, and the Christian profession; and is held, by divers, the most honourable charge in all heraldry. What brought it into such frequent use was the ancient expeditions into the Holy Land; and the holy war pilgrims, after their pilgrimage, taking the cross for their cognizance; and the ensign of that war being the cross.

In those wars, says Mackenzy, the Scots carried St Andrew's cross; the French a cross argent; the English a cross or; the Germans, sable; the Italians, azure; the Spaniards, gules.

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St. George's cross, or the red cross, in a field argent, is now the standard of England; that faint being the reputed patron of this nation.

Guillim enumerates thirty-nine different sorts of crosses used in heraldry, the several names of which here follow; and the descriptions of them are to be sought for under their proper articles. A cross voided, a cross wavy voided, a cross patée fimbriated, a cross patée fitché on the foot, a cross patée on three parts and fitché on the fourth, a cross engrailed, a cross patonée, a cross flory, a cross patonée voided, a cross avelane, a cross patée lambeaux, a cross furchée, a cross croiset, a cross croiset fitchée at the point, a cross bottonée, a cross pommée, a cross urdée, a cross dégradé fitchée, a cross potent, a cross potent fitché, a cross calvary, a cross croiset set in degrees, a cross patriarchal, a cross anchored, a cross molinée, a cross clechée, a cross flory or fleur-de-lis, a cross double fitchée, a cross a-feize points, a cross milrinée, a cross raguled, a cross pointed voided, a cross pall, a tau or St. Antony's cross, a cross voided and coupé, a cross coupé pierced, a cross molinée pierced lozenge-ways, a cross molinée quarter-pierced, a saltire or St. Andrew's cross, which will be distinctly spoken of under that denomination; and so all the other may be found more particularly described under the names of their several differences.

Colombiere makes seventy-two distinct sorts of crosses, of which we shall only mention those that differ from such as have been mentioned above; as a cross remply, which is only one cross charged with another; a cross party, that is, one half of one colour, and the other of another; a cross quartered, that is, the opposite quarters of several colours; a cross of five pieces, that is, of so many colours; a cross mouffue, and abaissée; a cross barbée; a cross croissanante, or crescented, that is, having a crescent at each end; a cross forked of three points; a cross pometée of three pieces; a cross ressercelée; a cross pointed; a cross ankered, and sur-ankeré; a cross ankered with snakes heads; a cross orlé; a high cross; a cross rayonnant, or casting out rays of glory; a cross of Malta; a cross of the Holy Ghost; a cross forked like the ancient rests for musquets; a cross with eight points; a cross bourdonnée; a cross cramponnée and tournée; a cross cablée; a cross inclining; a cross pater-nostre, that is, made of beads; a cross tresse; a cross fleuronée; a cross vuidee, glechée, and pometée; a cross crenellée and bailliée; a cross with four steps to every arm; a cross rounded; a cross and an half; a cross estoilée, or starways; a cross corded; a cross doubled of six pieces set together; a double cross split in pale; a long cross cut in pieces and dismembered; a cross coupé or cut through in fesse, of the two contrary colours to the field; a chevron surmounted by an half cross; four tails of ermine in a cross, the tops of the ermines opposite to each other in the middle; four pieces of vair placed cross-ways, and counterpointing in the centre; the cross or sword of St. James; a cross potence cramponnée on the dexter upper arm, and a potence about the middle of the shaft.

These are the various crosses we find in the aforesaid authors; which some may think too many, as not being all used in England: but heraldry extends to all countries; and all terms used require to be explained.

Nor is it only in crosses that the variety is so great; the like is found in many other bearings, and particularly in lions, and the parts of them; whereof the same Colombiere gives us no less than ninety-six varieties. Leigh mentions but forty-six several crosses; Sylvanus Morgan, twenty-six; Upton, thirty; Johannes de Bado Aureo, twelve; and so others, whom it is needless to mention. Upton owns he dares not presume to ascertain all the various crosses used in

arms, for that they are at present almost innumerable: and therefore he only takes notice of such as he had seen used in his own time.

Cross, in the *Manege*, a figure which horses describe in making curvets. To teach a horse to describe this figure, he should first be made to walk upon a straight line, about four times the space of his own length; then go backward upon the same line; afterwards advance to the middle of it, then go side ways to the right hand about twice the measure of his own length; the same on the left, and then return to the middle of the line, where he should stop and be caressed. When he can tread these lines equally, advance, go backward, and to either side, flying the heel, it will be right to put him to make a curvet at the beginning, the middle, and the end of each line; and if, upon repeated trials, he is found ready and obedient, he may be called upon to make the entire cross in curvets.

Cross, in *Mining*, are two nicks cut on the superficies of the earth, thus \pm , which the miners make when they take the ground, to dig for ore. This cross gives the miners three days liberty to make, and set on stones.

As many of these crosses as the miner makes, so many mears of ground he may have in the vein, if he set on stones within three days after the making his cross or crosses. But if he makes but one cross, and a stander-by makes the second, and a stranger makes the third, every one is served with the next mear, according as they have, first or last, sooner or later, made their cross, or crosses, upon the ground.

Cross, in *Surveying*, is a mathematical instrument of great utility to a land surveyor, as it enables him, while going about his survey with his chain, to measure the length of the station lines, at the same time to take offsets, or perpendicular directions to the corners of a field, or irregular boundaries; so as to get the exact figure of the boundaries of one or more fields. When a theodolite is dispensed with, the use of this instrument is absolutely necessary. The principle of this instrument consists in two lines of sight, placed at perfect right angles to each other, and about 4 inches apart, either on wood or brass. *Fig. 1, Plate III. (Surveying)* represents one usually made of brass by mathematical instrument makers; it consists of four sights fixed on a cross, at right angles to each other, and when in use is screwed to a wooden staff about 6 feet long, with an iron pointed ferril at the bottom, to go easily into the ground.

For portability, the sights are made to take away from the cross, by unscrewing four screws, *a, a, a, a*, and the staff by brass sockets to unscrew into three parts, each two feet in length.

Another kind of cross, (and rather more used by surveyors,) is made of a brass cylindrical tube, about two or three inches in diameter, with four sight-slits pierced out of it's circumference at perfectly equal distances, which cause any two of the opposite sights to be at right angles to the other two. (See *fig. 2.*)

The correctness of the sights of any cross may be easily proved, by looking at one object through two of the sights, and without moving the instrument, observing an object through the other two sights; then turning the cross on its staff, look at the same object through the opposite sights; if they are accurately in the direction of the sights before, the instrument is correct.

To survey a field by the cross, (suppose of the form of *A B C D E*, (*fig. 3.*)): place marks at the several angles. Measure the line *A C*, and also the perpendiculars from the angles, to that line as determined by the cross. To find a perpendicular, such as at *F*, place marks at pleasure on the line *A C*, and set the cross at the same time, in such a place,

so that through two of the sights you can observe two of the staves placed on that line, and the staff at E. If at this station E be not visible, remove the instrument backwards or forwards, till the lines, A F, E F, make a right angle in F, by which means the triangle, A F E, will be had. After the same manner is the point, H, found, where the perpendicular D H falls, whose length, together with that of H F, is measured to have the plot of the trapezium E F H D.

Again, measure H C, making a right angle with H D, and the figure of the triangle, D H C, will be had. Lastly, find the point G, where the perpendicular, B G, falls after the same manner, and the whole figure of the plot, A B C D E, will be given; the area of which is obtained by adding those of the triangles and trapezium together.

The determination of a very irregular boundary of a river, hedge, &c. by the cross, is as follows: Let A b i k l m n, *fig. 4*, be the irregular boundary, measure a straight line, as A B, along the side of the foregoing line, and while measuring, observe when you are opposite to any corner or bend of the hedge, as at *c d e*, &c. From thence measure the perpendicular offsets as at *e h*, *d i*, with the offsets staff; but if they are long ones, with the chain. The situations of these offsets are readily found by the cross as above directed.

Fig. 2, represents the cylindrical cross with the additional improvements by Mr. W. Jones. A small compass and needle are applied at its upper part, as at A, and a moveable graduated base at B, turning by rack and pinion. A nonius, C, is engraved at the bottom of the cylinder, so adapted to the graduations of the moveable limb, as to subdivide them into 5 minutes of a degree. Where no great accuracy is required, this small pocket instrument unites the advantages of a cross, circumferentor, and small theodolite.

A useful surveying cross by reflexion, (*fig. 5*.) was contrived many years ago by the father of the late Mr. George Adams. It consists of the index and horizon glasses of the Hadley's quadrant, placed together with the inclination of 45 degrees. The small mirror, A, is left half unsilvered, so that an object seen reflected first from the large glass, and then from the small one, will appear to coincide with another object, seen by direct vision through the unsilvered part of the glass, whenever the two objects subtend a right angle from the centre of the instrument. Thus, in *fig. 6*, suppose a person at C looking into the silvered part of the small mirror, sees the windmill, B, after two reflections, upon, or coincident with a tree, A, visible through the unsilvered part of the glass; he is certain that the windmill, C, is perfectly at right angles with the tree A, at the point where the centre of this optical square is held. Upon this principle, the reader may readily conceive how, with its assistance in the field, a perpendicular may be found to any given point, or from any particular point to raise a perpendicular. For the objects, by direct vision, through the transparent part of the glass, will always coincide with the objects seen by reflection, when they are at right angles to each other from the centre of the instrument. *Fig. 5*, represents the glasses uncovered; when complete, it has a small brass box cover, with an opening behind the glass A, and a slight hole for the eye, as shewn at C, *fig. 6*.

This small pocket instrument has been found useful to military officers for determining the perpendicular positions of men or marks in the field. See Jones's edition of Adams's Geometrical, &c. Essays, 1803. page 200.

CROSS, as a signature to a deed, is derived from the Saxon practice of affixing the sign of the cross, whether they could write or not. Several charters still remain, to which

kings and persons of great eminence affix "signum crucis manu propria pro ignoratione literarum." Hence is derived the expression of *signing* instead of *subscribing* a paper. In the 9th century, Herbaud Comes Palatu, though supreme judge of the empire by virtue of his office, could not subscribe his name. So late as the 14th century, Du Guesclin, constable of France, the greatest man in the state, and one of the greatest men of his age, could neither read nor write. The greater number of the clergy were not much less ignorant than the laymen. Many dignified ecclesiastics could not subscribe the canons of those councils in which they sat as members.

CROSS-Bars. See CARRIAGE.

CROSS-Bar Shot, are shot with iron bars crossing through them, sometimes standing six or eight inches out at both sides. They are used at sea, for injuring the enemy's rigging; and at sieges, for destroying the palisades in the covert-way, ditches, &c.

CROSS-Battery, in War. See BATTERY.

CROSS-Bill, in Chancery, is an original bill, by which the defendant prays relief against the plaintiff.

CROSS-Bill, in Ornithology, the English name of the *LOXIA CURVIROSTRA*, which see.

CROSS-Bow, a species of bow made use of before, and for a considerable time after, the invention of gunpowder, for throwing arrows, &c. See BOW, and ARCHERY.

CROSS, Cape, in Geography, a cape of Upper Canada, which projects from the N.E. side of St. Mary's river, at the outlet of Lake Superior, opposite the Falls. N. lat. 46° 30'. W. long. 84° 50'.—Also, a cape on the western coast of North America. N. lat. 57° 57'. E. long. 223° 21'.

CROSS-Creek, a township of America, in Washington county, Pennsylvania.

CROSS Causes, in Chancery, are such as occur on a cross-bill filed by the defendant against the plaintiff in the original cause: these are generally contrived to be brought in together, that the same hearing and the same decree may serve for both of them.

CROSS-Fell, in Geography, a mountain of England, in Cumberland, which, in Dr. Garnett's opinion, is the highest mountain in England. In Mr. Houseman's Description of Cumberland, its height above the level of the sea is stated to be 3390 feet; according to Pennant, 3839 feet. The summit presents a large heap of loose whitish free-stone, or, more probably, argillaceous grit.

CROSS-Fire, in the Art of War, is when the lines of fire from two or more parts of a work cross one another. It is frequently made use of, to prevent an enemy's passing through a defile. The flanks as well as the faces of two adjoining bastions afford cross-fires. The faces of two adjoining redoubts furnish a cross-fire.

CROSS-Furrow, in Agriculture, a term signifying the oblique or cross grip, or gutter, which is formed in tillage lands, for the purpose of receiving the superabundant rain, or other water, from the outer and other furrows, in order to convey it away from them into a side ditch, or other proper outlet. See FURROW.

CROSS-Furrowing, the process or operation of forming or constructing cross gutters or furrows. It is a business which requires considerable care and attention to perform it well; but which is capable of being executed either by the spade or the plough, when properly constructed for the purpose. Some attentive farmers are likewise in the habit of having recourse to the spade after the plough, in performing this sort of field work. It should always be executed in a perfect and complete manner, as much of the success of the crop depends upon it. See FURROW, and FURROWING.

Cross-grained Stuff, in *Joinery*. Wood is said to be cross-grained, when a bough or branch has shot out of it: for the grain of the branch, shooting forward, runs athwart that of the trunk.

In wood well grown this defect is scarce perceivable, except in working; but in deal-boards these boughs make knots. If the bough grew up with the young trunk, instead of a knot is found a *curling in the stuff*; very sensible under the plane.

Cross-Haven, in *Geography*, a small town of the county of Cork, Ireland, situated at the mouth of the river Oonbuy, which flows into the west of Cork harbour. Sir Francis Drake, in 1589, having a small squadron of five ships of war, was chased into this harbour by a superior fleet of Spaniards, and moored his ships in a safe basin behind a hill, whilst the Spaniards failed up the harbour of Cork in pursuit of him, and returned without discovering his retreat. A little up this river Oonbuy, near the spot where the castle of Corigoline was built, the first earl of Cork intended to have founded a town, which should rival Cork in trade; but the rebellion of 1641 ruined the design. Cross-haven has about 50 houses, placed one above another on the side of a hill, the permanent inhabitants of which are chiefly fishermen; but it is much frequented in the summer for sea-bathing. It is about 9 miles from Cork. Smith.

Cross-Headings, in *Canal-making*, are small culverts or foughs, branching from the main heading or drain, where a tunnel or subterraneous arch is to be formed, for more effectually collecting the springs out of the strata, without which it is often impossible to proceed with the work. See CANAL, and TUNNEL.

Cross-Jack, or *Square-Sail* of a sloop, in *Nautical Language*, is a quadrilateral sail, square on the head and leeches; the head is bent to the cross-jack yard, and it hangs at right angles with the ship's length, and parallel to the deck, extending within six inches of the cleats on the yard-arms. The depth of this sail is four-fifths of the depth of the fore-leech of the main-sail. This sail has two reef-bands, four inches broad; the lower one, at one-sixth of the depth of the sail from, and parallel to, the foot; and the upper one at the same distance from the head. A reef-criingle is made at each end of the upper reef-band; and three bow-line-criingles are made on each leech; the upper bow-line-criingle is on the middle of the leech, and the others are equally distant from that and the clue. The clues are sometimes marled on; and for this purpose, ten marling-holes are made each way from the clues. The bolt-rope, on the foot and leeches, should be $1\frac{1}{2}$ inch or 2 inches in circumference; and, on the head, 1 or $1\frac{1}{2}$ inch. The clue-rope, when there is one, should be $2\frac{1}{2}$ inches. When sewing on the bolt-rope, one inch of slack-cloth should be taken up in every cloth in the head and foot. To find the quantity of canvas in this sail; multiply the number of cloths by the depth, and add the quantity in the foot-gores, bands, and pieces.

Cross Island, in *Geography*, an island in the Atlantic ocean, near the coast of Mann, at the entrance into Machias bay. N. lat. $44^{\circ} 30'$. W. long. $67^{\circ} 15'$.—Also, one of the smaller Shetland islands of Scotland; 35 miles S. of Lerwick.

Cross Multiplication, a method of multiplying feet and inches, by feet and inches, or the like; so called, because the members are multiplied *cross-wise*. See MULTIPLICATION.

Cross-Piece, in *Ship-Building*, a rail of timber extended over the windlafs of a merchant-ship, from the knight-heads

to the belfry. It is stuck full of wooden-pins, which are used to fasten the running-rigging as occasion requires.

Cross Sound, in *Geography*, a bay of the North Pacific ocean, on the west coast of North America, discovered by captain Cook on the 3d of May, 1778, and so called from the name given in the English calendar to the day of discovery. This inlet appeared to branch into several arms, the largest of which turned to the northward. The S.E. point of this sound is a high promontory, to which was given the name of *Cross Cape*. It lies in N. lat. $57^{\circ} 57'$. E. long. $223^{\circ} 2'$. The most advanced point of land to the N.W. lies under a very high peaked mountain, to which was given the name of "Mount Fair-weather." M. la Pérouse, in his "Voyage round the World," (vol. i. Eng. edit.) observes, that the entrance into Cross Sound appears to form two very deep bays, where it is probable ships might find very good anchorage. At this Sound the high mountains covered with snow terminate: their summits are from 13 to 1400 toises high. The lands that form the coast to the S.E. of Cross Sound, though 8 or 900 toises high, are covered with trees to the top; and the chain of primary mountains seems to go very far into the interior of the continent. To the northward of Cross Sound is Mount Crillon, which is almost as high as Mount Fair-weather, which lies to the northward of the bay des Français. These points serve as land-marks to the harbour which they surround; and as their latitude does not differ 15 minutes, one of them, in coming from the southward, may be easily mistaken for the other. Mount Fair-weather is accompanied with two less elevated mountains; and Mount Crillon, which is more isolated, inclines its point to the southward. In the vicinity of Cape Cross there is a great number of small islands very thickly wooded, between which are several channels that must have formed good roads. Captain Cook has called this part of the coast the "Bay of Islands." From Cross Sound to Cape Enganno (the Cape Edgecumbe of Cook) lies an extent of coast of 25 leagues, in which are 25 different harbours; and Perouse says, that three months would scarcely suffice to explore this labyrinth of navigation. Cape Enganno is a low land covered with trees, and stretching far out to sea. Mount St. Hyacinth (Mount Edgecumbe of Cook) rests upon it and forms the frustum of a cone, but rounded off at the top, and is at least two toises high. To the eastward of this mount is an extensive bay, so open to the S. and S.E. winds, which are the most dangerous, that navigators ought to dread anchoring there. Captain Dixon anchored there to trade for furs, and gave it the name of "Norfolk Sound." Its latitude was $53^{\circ} 5'$ N., and its longitude $138^{\circ} 16'$ W. from the meridian of Paris. Captain Cook perceived the mouth of this creek May 2d, 1778, but did not anchor there. Its shores are covered with trees, of an equal height with those to the southward of Cross Sound. The summits of the hills are somewhat covered with snow; and they are so pointed and numerous, that their appearance is altered by the least change of situation. These hills are some leagues within the land. Smaller hills lie against their sides, and are connected with a low and undulating base, extending as far as the sea. Before the shore lie a great number of islands; for to the northward and southward of Cape Enganno the coast is bordered with islands for the space of 10 leagues. From the extremity of these islands to the cape, called by Perouse "Cape Tschirikow," in honour of the celebrated Russian navigator who landed on this part of America in 1741, are two large bays, appearing to stretch far into the land, and called by La Pérouse "Port Necker" and "Port Guibert." Dixon anchored

chored in one of them, which he called "Port Banks." N. lat. $56^{\circ} 35'$. W. long. from Paris $137^{\circ} 20'$. At a small distance lies a cluster of five islands, separated from the continent by a channel four or five leagues wide, which neither captain Cook nor the pilot Maurelle has noticed. La Perouse called them "Iles de la Croÿere." from the celebrated French geographer, Delisle de la Croÿere, who accompanied captain Tschirikow, and who died during that voyage, and whose place of interment was discovered by captain Clerke in Kamtschatka. La Perouse, during his stay at Petropawlowka, had an opportunity of retaliating this act of kindness with similar liberality; for finding that the inscription on captain Clerke's tomb had been destroyed by the Kamtschadales, he took pains to re-establish it, as it occurs in the account of Cook's third voyage, and in order to prolong its duration, he caused it to be engraved on copper. Dixon has distinguished these five islands by the name of "Foggy islands." La Perouse has placed them in $55^{\circ} 50'$ N. lat. and $137^{\circ} 11'$ W. long.; Dixon in $55^{\circ} 50'$ N. lat. and $137^{\circ} 3' 45''$, reduced to the meridian of Paris. La Perouse, being in $55^{\circ} 39' 31''$ N. lat. and $137^{\circ} 5' 23''$ W. long., according to his time-keepers, perceived great openings between considerable islands, at a distance from the continent; which Archipelago commences four leagues to the S.E. of Cape Tschirikow, and apparently extends as far as Cape Hector. Port Bucarelli of Maurelle is in this part. (See BUCARELLI.) La Perouse suggests, that from Cross Sound he had coasted only along islands; and Dixon confirms his opinion. La Perouse, sailing along the coast at a distance of 3 leagues, saw the isles of "San Carlos," the principal of which lies S.E. and N.W., and may be 2 leagues in circumference. A long chain connects it with other little islands, stretching far out into a channel of considerable breadth. The place of the island farthest from the continent, at the distance of half a league, was ascertained to be $54^{\circ} 48'$ N. lat. and $136^{\circ} 19'$ W. long. Ranging for a considerable distance along the coast, La Perouse discovered a bay, which he called "La Touche bay," N. lat. $52^{\circ} 39'$, W. long. $134^{\circ} 49'$, affording, as he had no doubt, very good anchorage. Advancing farther, he saw a cape, which apparently terminated the coast of America; and he also perceived four or five small islands near it, which he named "Islets Kerouart," and the point "Cape Hector," the cape "St James" of Dixon; which, according to La Perouse, is in N. lat. $51^{\circ} 57' 20''$, and W. long. $133^{\circ} 37'$, and according to Dixon in $51^{\circ} 46'$ N. lat. and $132^{\circ} 20'$ W. long., reduced to the meridian of Paris. The opposite coast of "La Touche bay" was named by La Perouse "Cape Butache;" and the breadth of the channel or gulf, from east to west, was ascertained to be 30 leagues between Cape Hector and Cape Fleurieu (Cape Cos of Dixon). The situation of this cape is $51^{\circ} 45'$ N. lat. $131^{\circ} 15'$ W. long. according to La Perouse; and N. lat. $51^{\circ} 30'$, W. long. from Paris $130^{\circ} 32'$, according to Dixon. This cape forms the point of a very high island. Along the coast lie several clusters of islands, called by La Perouse "Isles Sartine," and by Dixon "the Islands of Beresford;" situated, according to the former, in N. lat. $50^{\circ} 56'$, W. long. $131^{\circ} 38'$; and, according to the latter, in N. lat. $50^{\circ} 52'$, and W. long. from Paris $132^{\circ} 3'$. A passage may possibly lie between these islands, but it would be dangerous to attempt it. The "Woody Point" of captain Cook, forming a continuation of the coast from mount St. Elias to Nootka, is situated in N. lat. $50^{\circ} 4'$, W. long. from Paris $130^{\circ} 25'$. For other observations on this celebrated navigator on the west coast of America, we refer to *Port des FRANCAIS*, and the account of his voyage; and also to *NOOTKA*.

Cross-staff, a mathematical instrument, otherwise called the *FORE-staff*.

Cross-tining, in *Agriculture*, a term applied to a method of harrowing land, in which the harrow is made to pass up the interval it went down before, and down that which it previously passed up. See *HARROWING*.

Cross-trees, in a ship, cross-pieces of timber set on the head of the mast, and bolted, and let into one another very strongly. They are four in number, and are generally called cross-trees, but strictly speaking, only those which go thwart ships are called cross-trees; the other, in the largest ships, are called treffel-trees. Their use is to keep and bear the top-masts up; for the foot of the top-mast is always fastened into them, so that they bear all the stress. They also bear the tops, and are necessary to all masts which carry any other top, or flag-staff, at the head.

Cross-tree-yard, is a yard standing square, just under the mizen-top, and to it the mizen top is fastened below. See *CROSS-jack* and *YARD*.

Cross-veins, in *Mining*, are such mineral veins as branch from or cross the principal or rake-veins; if small, these are in Derbyshire denominated *STRINGS*, or *SCRINS*, which see. These cross-veins, according to Jameson, the translator of Werner, take place usually on the over-hanging or upper side of the vein, and less frequently on the lower or lying side.

Cross, Winter, in *Botany*. See *ERYSIMUM*.

Cross-wort. See *GALIUM cruciatum*.

CROSSÆA, in *Ancient Geography*, a country of Europe, which was a part of Thrace, before the kings of Macedonia united it to their kingdom. It was in a peninsula between the Thermaic gulf to the west, and the gulf of Strymon to the east. It contained the towns of LIPAXOS, COMBREA, LISÆ, GIGONOS, CAMPSA, IMILA, and GENIA. Steph. Byz. and Thucydides call it *Cronsis*, and the former makes it a part of Macedonia.

CROSSANDRA (from *κροσσος*, *frimbria*, and *ωνος*, *vir*, alluding to the fringed anthers), Salisb. Parad. Lond. t. 2. (*Ruellia infundibuliformis*; Roxb. MSS.) Clafs and order, *didynamia angiospermia*. Nat. Ord. *Acanthi*; Juss.

Gen. Char. *Cal.* five-leaved; leaves convolute-imbricated; inner ones gradually smaller. *Cor.* monopetalous; tube slender, enlarged at the base, swelling a little at the insertion of the stamens, open at the mouth; border one-lipped, trifid; segments emarginate. *Stam.* Anthers four, nearly sessile, fringed at the edges of the valves. *Pistl.* Stigma bifid. *Pericarp.* with two-seeded cells.

Sp. C. *undulata*. A pretty large upright shrub, flowering all the year round. *Stem* cylindrical, jointed; branches opposite. *Leaves* opposite, ovate-lanceolate, entire, undulated; petioles jointed at the base. *Flowers* in a dense terminal spike, of a dull orange colour; bracts three under each flower, ending in a sharp brittle; the middle one the largest. *Pericarp* swelled at the base into a round nut. Common in the pagoda gardens at Bengal.

CROSSE, a name given by the people of Guinea, and some other parts of Africa, to a kind of fruit very common among them. It very much resembles our common hazel-nut, but that the shell is not so hard. Phil. Transf. N^o 108.

CROSSE, Isle a la, in *Geography*, the name of a fort in North America, near Beaver river, situated on a low isthmus, in N. lat. $55^{\circ} 25'$. W. long. $107^{\circ} 48'$.—Also, a lake into which the Shagoina strait and rapid lead, in which the course is S. 20 miles, and S.S.W. 14 miles, to the Point au Sable; opposite to which is the direction S. of the Beaver river, bearing S. 6 miles; the lake in the distance

distance run does not exceed 12 miles in its greatest breadth. It now turns W.S.W., the isle a la Croise being on the south, and the main land on the north; and it clears the one and the other in the distance of 3 miles, the water presenting an open horizon to right and left; that on the left formed by a deep narrow bay, about 10 leagues in depth; and that to the right by what is called "la Riviere Creuse," or Deep-river, being a canal of still water, which is here 4 miles wide.

This lake and fort take their names from the island just mentioned, which received its denomination from the game of the crofs, that forms a principal amusement among the natives. The situation of this lake, the abundance of the finest fish in the world found in its waters, the richness of its surrounding banks and forests, in moose and fallow deer, with the vast number of smaller animals whose skins are precious, and the numerous flocks of wild fowl that frequent it in the spring and fall, make it a most desirable spot for the constant residence of some, and the occasional rendezvous of others, of the inhabitants of the country, particularly of the Knisteneaux. Who were the original people that were driven from it when conquered by the Knisteneaux, is not now known, as not a single vestige remains of them. The latter and the Chépewians are the only people that have been known here; and the last mentioned evidently consider themselves as strangers, and seldom remain longer than three or four years without visiting their relations and friends in the barren grounds, which they term their native country. The Knisteneaux, who for some time treated them as enemies, now allow them to hunt to the north of the track from Fort du Train upwards; but when they occasionally meet them, they demand contributions, and punish resistance with their arms. When the Europeans first penetrated into the country, in 1777, the people of both tribes were numerous; but the small pox was so fatal, that there does not exist of the one, at present, more than 40 resident families, and the other has been from about 30 to 200 families. Since traders have spread themselves over this country, it is no more the rendezvous of the errant Knisteneaux, some of whom used annually to return thither from the country of the Beaver river, which they had explored to its source in their hunting and war excursions, and as far as the Salkatchwine, where they sometimes met people of their own nation, who had prosecuted similar conquests up that river. From thence they returned in the spring to the friends they had left; and met with others, who had penetrated, with the same designs, into the Athabasca country. When they met, they occupied their time in feasting, dancing, and other pastimes, which were occasionally suspended for sacrifice and religious solemnity; while the narratives of their travels, and the history of their wars, amused and animated their festival. After a short interval spent in this manner, they prepared for their annual journey to Churchill, to exchange their furs for such European articles as they wanted. The length of the way, and shortness of the season, demanded dispatch; and in this business the most active men of their tribes, and some young women, engaged; remaining at Churchill factory but a little while for bartering their commodities, and indulging themselves with spirituous liquors.

From isle a la Croise fort it is not more than two miles to a point of land which forms a check of that part of the lake called the "Riviere Creuse," which preserves the breadth already mentioned for upwards of 20 miles; then contracting to about two, for the distance of 10 miles more, it opens to "lake Clear." Mackenzie's Voyages from Montreal, &c. Introduction.

CROSSELET, *little cross*, a diminutive of cross, used in *Heraldry*, where we frequently see the shield covered with crosselets; also fesses, or other honourable ordinaries charged or accompanied with crosselets.

Crosses themselves frequently terminate in crosselets.

CROSSEN, in Latin *Crossia*, in *Geography*, a small but handsome town of Prussia, in the duchy of Silesia, on the confluence of the river Bober with the Oder, 26 miles S.E. of Frankfort on the Oder; E. long. 15° 20'. N. lat. 51° 5'. The country about Crossen is uncommonly fertile, and famous for its orchards and vineyards, the latter of which yield a very good sort of white wine.—Also, a small town of Saxony, in the circle of Naumburg Zeitz, on a small river called the white Elster. It has about 600 inhabitants, who derive their principal maintenance from agriculture, and excellent fish ponds.

CROSSIN, a town of Poland, in the palatinate of Lublin; 24 miles S.W. of Lublin.

CROSSMALINA, a small post town of the county of Mayo, Ireland, on the river Deel, near the northern extremity of Lough Conn. It is on the road from Castlebar to Killalla, and is 134 miles N.W. from Dublin, and 15 miles N. from Castlebar.

CROSSOPETALUM, in *Botany*, Brown. See *MYGINDA rhabcoma*.

CROSSOSTYLIS, (from *κροστος*, *fimbria*, and *στυλις*, *columella*, alluding to the fringed style.) Schreb. 1149. Willd. 1307. Juss. 432. Forst. gen. tab. 44. Class and order, *monadelphia polyandria*. Nat. Ord. *Salicarie*? Juss.

Gen. Ch. *Cal.* top-shaped, quadrangular, attached by its lower part to the germ, permanent, with four egg-shaped spreading divisions. *Cor.* Petals four, elliptical; claws narrow; inserted into the calyx; nectaries twenty, filiform, ciliated, alternating with the filaments. *Stam.* Filaments twenty, almost the length of the calyx, united at the bottom into a short cup; anthers small, roundish. *Pist.* Germ superior, convex; style the length of the stamens, cylindrical; stigmas four, spreading, lacinated, or fringed. *Peric.* Berry? hemispherical, striated, enveloped in its lower part by the calyx, one-celled. *Seeds* numerous, globular, attached to a central column.

Esf. Ch. Calyx four-parted. Petals four, inserted into the calyx. Nectaries twenty, alternating with the stamens after they become separate. Stigmas four, fringed.

Sp. C. *biflora*. A native of the Society islands.

CROSSWICKS, in *Geography*, a village of America, in the state of Jersey, and county of Burlington, through which the stages pass from New York to Philadelphia. It has a respectable Quaker meeting-house; 4 miles S.W. of Allen town, 8 S.E. of Trenton, and 14 S.W. of Burlington.

CROSTIGAL, a small town of Saxony, in the circle of Leipzig, with 284 inhabitants, which is so close to the gates of the ancient town of Wurtzen, that it is considered as one of its suburbs.

CROSTILO, a river of Italy, which runs into the Po, about a mile N.W. from Lazzara, in the duchy of Mantua.

CROTALARIA, in *Botany*, (from *κροταλον*, the name of an ancient noisy brazen instrument; alluding, according to Linnæus, to the form of the legume; but, according to others, because the seeds in the ripe legumes make a rattling noise when shaken.) Linn. gen. 862. Schreb. 1172. Willd. 1343. Gært. 859. Juss. 354. Vent. 3. 390. Class and order, *diadelphia decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* often with three deep divisions; the two upper ones lanceolate, pressing on the standard, lower one lanceolate,

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lanceolate, concave, three-cleft, supporting the keel; sometimes with five deep, nearly equal divisions. *Cor.* papilionaceous; standard generally large, somewhat heart-shaped, acute, depressed on the sides; wings egg-shaped, often about half the length of the standard; keel acuminate, recurved, most commonly about the length of the wings. *Stam.* Filaments all united towards the base into a membranous sheath, with a fissure at the back; anthers simple. *Pist.* Germ superior, oblong, often hirsute; style simple, bent inwards, ascending; stigma obtuse. *Peric.* Legume often pedicelled, most commonly short and turgid, one-celled. *Seeds* generally few, roundish-kidney-shaped.

Est Ch. Legume turgid, inflated; filaments connate, with a dorsal fissure.

* *Leaves simple.*

Sp. 1. *C. perfoliata*. Linn. Sp. Pl. 2. Mart. 2. Lam. 1. Dill. elth. tab. 102. (*Rafnia perfoliata*; Willd.) "Leaves perfoliate, cordate-egg-shaped." *Stem* apparently shrubby, but the branches perish every year, two feet high or more, branches cylindrical, smooth, leafy. *Leaves* alternate, smooth, stiff, veined. *Flowers* yellow, axillary, solitary, on very short peduncles. *Legumes* smooth, rather short, inflated. A native of open woods in the back part of Carolina. 2. *C. amplexicaulis*. Linn. Sp. Pl. 3. Mart. 3. Lam. 2. (*Rafnia amplexicaulis*; Willd. Thunb. Geniita perfoliata; Seb. thes. 1. tab. 24. fig. 5.) "Leaves all heart-shaped, embracing the stem, reticularly veined, alternate; floral ones opposite, coloured; flowers solitary, axillary." A perfectly smooth shrub. *Stem* a foot and half high, slender, leafy; branches alternate, very slender. *Leaves* entire. *Flowers* yellow, almost sessile; two upper divisions of the calyx large, truncated with an oblique point; standard roundish, raised. A native of the Cape of Good Hope. 3. *C. reniformis*. Lam. 3. "Leaves cordate-kidney-shaped, embracing the stem, reticulated, smooth; floral ones orbicular, legumes compressed, solitary, nearly sessile." *Branches* smooth, woody. *Leaves* larger and rounder than those of the preceding species, entire. *Legumes* from nine lines to an inch long, smooth. *Calyx* as in the preceding species. A native of Africa. 4. *C. cuneiformis*. Lam. 4. "Smooth; leaves ovate-wedge shaped; lower ones reflex; uppermost inversely egg-shaped, mucronate; floral ones nearly opposite." *Stems* somewhat woody, full of pith, not so thick as a goose-quill, smooth, leafy; branches simple, with one or two leaves at the summit. *Stem leaves* alternate, almost sessile, not reticulated, from eight to ten lines long, and seven or eight broad. *Flowers* yellow, axillary, solitary; peduncles shorter than the leaves; calyx smooth, short. A native of Africa. 5. *C. capitata*. Lam. 5. "Villous; leaves lanceolate, scattered, crowded, sessile; flowers in heads." *Stem* woody, cylindrical, leafless; marked with scattered, somewhat callous scars; branched near the top; flowers fasciated, ascending, leafy their whole length. *Leaves* slightly convex above, entire, six or seven lines long. *Flowers* variegated with purple-violet and white; calyx rather short, with five divisions, obtuse at its base; filaments diadelphous; germ thickly set with reddish hairs. A native of the Cape of Good Hope. 6. *C. chinensis*. Linn. Sp. Pl. 5. Mart. 5. Lam. 6. Willd. 4. and 21. "Leaves egg-shaped, somewhat petioled; stipules very minute." Linn. "Villous-silky; leaves ovate, oblong, obtuse, somewhat petioled; stipules awl-shaped; style curved and twisted at the base, reflexed." Lam. *Stems* and branches pubescent, cylindrical. *Leaves* rather obtuse, quite entire, a little hairy on both sides. *Racemes* few-flowered, rough with hairs; bractes lanceolate, the length of the peduncles; calyxes hairy, the

length of the corolla; corolla yellow, with a striated banner; stipules awl-shaped. Linn. Whole plant clothed with reddish hairs, which are silky on the young shoots. *Stem* woody, full of pith, with numerous simple branches. *Leaves* alternate, numerous; lower ones near two inches long; upper ones very small; stipules four or five lines long, commonly several together in a kind of fascicle. *Flowers* in short racemes, which form a terminal panicle; bractes lanceolate, three or four lines long. *Legumes* scarcely five lines long, small, oval, inflated, villous. A native of China and the island of Java. Obs. La Marck states his plant to be the chinensis of Linnæus. Willdenow thinks it distinct, and has taken it up separately as such, and called it paniculata. Their respective descriptions do not appear to us to be absolutely inconsistent with each other, though the resemblance is not striking. The last five species were communicated by Sonnerat to La Marck, who described them from dried specimens. 7. *C. sagittalis*. Linn. Sp. Pl. 4. Mart. 4. Lam. 7. Willd. 1. (*C. americana*, caule alato; Mart. Cent. tab. 43. *C. hirsuta minor*; Herm. Lugdb. tab. 203. Pluk. Alm. 122. tab. 169. fig. 6. *Sagittaria cordialis*. Marg. hist. 1. 55. β . *C. Sagittalis glabra*; Pluk. Alm. 122. tab. 169. fig. 6.) "Leaves lanceolate; stipules decurrent, solitary, two-toothed." Linn. *Root* annual. *Stem* about a foot high, herbaceous, erect, stiff, pubescent, branched. *Leaves* alternate, entire, rounded at the base, on short petioles, hoary underneath, and somewhat hirsute, but sometimes smooth; stipules at the sides of the petioles, bifid, with two open teeth, so as to appear sagittate. *Flowers* pedicelled from three to five, in short peduncled racemes, at the top of the stem and branches; calyx nearly or quite as long as the corolla, clothed with reddish hairs, divided into five ovate-lanceolate segments. *Legumes* from twelve to fifteen lines long, almost sessile in the calyx, inflated, vesicular, smooth. A native of Virginia, the West Indies, and Brazil. 8. *C. parviflora*. Willd. 2. Roth. Cat. 1. 83. and 2. 84. "Leaves lanceolate; upper stipules decurrent, very slightly two-toothed." *Root* annual, very similar to the preceding, but smaller in all its parts. A native of Virginia and Carolina. 9. *C. rubiginosa*. Willd. 3. "Leaves lanceolate, villous; upper stipules lanceolate, decurrent; calyxes villous." *Root* annual. A plant the length of a finger, branched, villous. *Stem* and branches, especially the younger ones, beset with numerous, spreading, ferruginous hairs. *Leaves* an inch long, oblong-lanceolate, on short petioles; stipules on the upper part of the stem towards the flower oblong-lanceolate, decurrent. *Flowers* about four in a raceme, yellow; calyx the length of the corolla or longer, covered with ferruginous hairs. *Legume* turgid, obtuse, mucronate with the permanent style. A native of the East Indies. 10. *C. anthylloides*. Lam. 8. "Leaves linear, acute, villous underneath; corollas and legumes included in the very hirsute ferruginous calyx." *Stem* a foot high, or a little more, simple, cylindrical, rather slender, full of pith, naked towards the base, leafy, and clothed with reddish hairs on the upper part. *Leaves* two or three inches long, alternate, narrow; stipules small, narrow, villous. *Flowers* sessile, drooping, in a terminal raceme; calyx oval-campanulate, completely concealing both the flower and the legume, with five erect, obtuse segments. *Legumes* oval, inflated, terminated by a style similar to that of *C. chinensis*. Found by Commerçon in the island of Java. 11. *C. glauca*. Willd. 5. "Leaves linear lanceolate, smooth, peduncles axillary, about three-flowered." *Stem* a foot high, erect, branched from the base; branches erect. *Leaves* an inch and half long, nearly sessile, glaucous; stipules scarcely apparent. *Peduncles* twice

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the length of the leaves; corolla larger than the calyx. A native of Guinea. 12. *C. fruticosa*. Mart. 28. Mill. Houft. MSS. "Leaves linear-lanceolate, hirtute; petioles decurrent; stem shrubby." Stem four feet high, taper, with numerous slender branches. Flowers small, dirty yellow, alternate, three or four in a loose spike. Legumes about an inch long, very turgid, dark blue when ripe. A native of Jamaica; cultivated by Miller. 13. *C. juncea*. Linn. Sp. Pl. 6. Mart. 6. Willd. 6. Hort. Kew. 3. Bot. Mag. 490. (*C. benghalensis*; Lam. 9. Pluk. alm. 122. tab. 169. fig. 5.) "Leaves lanceolate, nearly sessile; stem striated." Linn. "Stem rod-like, simple; leaves lanceolate, nearly sessile; lower lip of the calyx three-parted beyond the middle." Lam. The habit of a spartium. Root annual. Stem three or four feet high, angular, stiff, rather slender, leafy, branched. Leaves alternate, covered in native specimens with soft silvery hairs, but only slightly pubescent when cultivated in the European stoves. Flowers in terminal racemes, large, deep yellow, resembling those of the Spanish broom; calyx villous, almost silky; standard large; keel much bent, acute, two-leaved, paler than the standard; filaments scarcely united at the base; five of the anthers erect, long, linear; five short, oval, incumbent; germ sessile, oblong-conical, hairy; style bent, pubescent. A native of the East Indies. La Marck observes that Linnæus has confounded two plants under his *juncea*, and has restored to that now before us the name given it by Plukenet: but as it is known and cultivated in this country under the Linnæan name, we have given a new one to the next species, to which the other synonyms of Linnæus and the description in Richard's edition belong. 14. *C. tridentata*. (*C. juncea*; Lam. Tandel-cotti; Rheed. Mal. 9. 47. tab. 26. Rai. Hist. 3. 464. n. 9.) "Stem branched at the base; leaves wedge-lance-shaped, somewhat petioled; lower lip of the calyx three-toothed." Lam. β. *C. fericea*; Burm. Ind. 156. tab. 48. fig. 1. Stems slightly striated, branched. Leaves near together, enlarged towards the summit, terminated by a sharp point, smooth and dark-green above, pubescent and a little silky underneath. Flowers in short terminal racemes, which are more leafy than those of the preceding species; germ smooth. A native of the East Indies. La Marck observes that it more resembles *C. retusa* than *C. juncea*. 15. *C. fericea*. Willd. 7. Retz. Obs. 5. 26. "Leaves lanceolate, silky underneath; legumes silky; raceme terminal; stem furrowed." Root annual. Leaves acute; stipules semi-cordate. Flowers much larger than those of Burman's *fericea*, which La Marck supposes a variety of the preceding. A native of the East Indies. 16. *C. limifolia*. Linn. jun. Supp. 322. Mart. 14. Lam. 18. Willd. 8. "Leaves linear, silky, obtuse, mucronate; raceme terminal; legumes smooth, scarcely longer than the calyx; stem somewhat striated." Nearly allied to *C. juncea*. Stem varying from half a foot to a foot and half high, erect, filiform, rush-like, simple, hirtute, hoary. Leaves rather short, on short petioles. Flowers yellow, drooping, in a long raceme. Legumes short, obtuse. A native of the East Indies. La Marck suspects that it does not materially differ from Burman's *fericea*. 17. *C. retusa*. Linn. Sp. Pl. 8. Mart. 8. Lam. 11. Willd. 13. Gært. tab. 148. fig. 2. (*C. asiatica folio singulari cordiformi*; Herm. Lugdb. 200. tab. 201. Tourn. 644. *C. major*; Rumph. Amb. 5. 278. tab. 96. fig. 1. *Dolichos cuneifolius*; Forsk. Ægypt. 134. Tandel-cotti; Rheed. Mal. 9. 44. tab. 25. Rai. Supp. 464.) "Leaves oblong, wedge-shaped, retuse." Root annual. Stem from two to four feet high, striated, leafy, branched. Leaves alternate, quite obtuse, smooth on both sides; stipules small, awl-shaped. Flowers yellow, in a ter-

minal raceme; calyx nearly smooth; upper lip with two ovate-lanceolate divisions; lower one with three acute teeth. Legume smooth, wider upwards, inflated, turgid at the sides, depressed along the feminiferous suture, gradually attenuated into the peduncle. Seeds from fifteen to twenty. A native of the East Indies. 18. *C. gerifloides*. Lam. 12. "Leaves linear-lanceolate, smooth, scattered, sessile; racemes short, few-flowered; calyxes and legumes hirtute." A shrub with the habit of a broom. Branches slender, cylindrical, smooth and slightly tubercled towards the base, leafy almost their whole length, a little villous towards the summit. Leaves scarcely an inch long, mucronate. Flowers in axillary racemes; calyx flat or concave at the base, with five oval-lanceolate divisions, particularly villous at the edges; keel much bent. Legumes covered with reddish hairs. A native of the Cape of Good Hope. 19. *C. imbricata*. Linn. 7. Mart. 7. Willd. 9. (*Borbonia axillaris*; Lam. Cytiso affinis; Pluk. Mant. 63. tab. 388. fig. 3.) "Leaves oblong, silky, shining; flowers axillary, sessile, near the top of the branches." A small shrub. Leaves acute, scattered, somewhat imbricated, without stipules. Flowers purple, solitary; calyx clothed with red silky down; divisions very acute. A native of the Cape of Good Hope. 20. *C. villosa*. Mart. 29. Mill. Linn. Hort. Clif. 357. Herm. Lugdb. 170. "Leaves egg-shaped, villous; petioles entirely simple; branches cylindrical." A shrub about five feet high, with several taper, smooth branches. Leaves fitting close to the branches, roundish, hoary, green, soft to the touch. Flowers fine blue, in loose racemes. A native of the Cape of Good Hope. 21. *C. parviflora*. Willd. 10. Thunb. Prod. 124. "Leaves egg-shaped, acute, tomentous; flowers axillary, nearly sessile; legumes egg-shaped." 22. *C. lanata*. Willd. 11. Thunb. 124. "Leaves egg-shaped, acute, woolly; flowers axillary, nearly sessile." 23. *C. reflexa*. Willd. 12. Thunb. 125. "Leaves egg-shaped, acute, tomentous, reflexed; flowers in heads; branches retroflexed." The last three are natives of the Cape of Good Hope. 24. *C. sessiliflora*. Linn. Sp. Pl. 9. Mart. 9. Lam. 13. Willd. 14. "Leaves lanceolate, nearly sessile; flowers sessile, lateral; stem equal." Root annual. Stem scarcely a foot high, erect, cylindrical, striate-furrowed, but little branched. Leaves smooth above, hairy underneath; stipules scarcely visible. Flowers blue, axillary, with two oblong bractes. A native of China. 24. *C. triflora*. Linn. 10. Mart. 10. Lam. 14. Bot. Mag. 482. (*Rafnia triflora*; Willd.) "Leaves egg-shaped, sessile, smooth; branches angular; peduncles growing by threes, lateral, one-flowered." Root biennial. Whole plant smooth. Stem three or four feet high, strong, often unbranched. Leaves three inches long, large, numerous, very handsome when young, becoming glaucous as the plant advances. Flowers bright yellow; bractes like the leaves, but smaller, one to each flower, about the length of the peduncle. Legumes generally containing only one seed. A native of the Cape of Good Hope; introduced into Kew garden by Masson, in 1786. It is a green-house plant, readily propagated by seeds, which will ripen in the open air in our climate, if the weather be favourable. 25. *C. verrucosa*. Linn. Sp. Pl. 11. Mart. 11. Willd. 15. (*C. angulata*; Lam. 16. *C. asiatica, folio singulari verrucoso*; Herm. Lugdb. 199. Tourn. 644. Rai. Hist. 1893. *C. cærulea*; Jacq. Ic. Rar. tab. 144. *C. foliis solitariis*; Burm. Zeyl. 81. tab. 34. Pee-tand-li-cotti; Rheed. Mal. 9. 53. tab. 29.) "Leaves somewhat egg-shaped; stipules crescent-shaped, embracing the stem; stems quadrangular, furrowed." α. "Leaves egg-shaped." Root annual. Stem a foot and half or two feet high, erect, zig-zag, branched,

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branched, with four very remarkable acute angles. *Leaves* near two inches long, alternate, somewhat petioled, green, almost smooth, warty, (but La Marek thinks it probable that this is rather accidental than constant.) *Flowers* light blue, drooping, in peduncled terminal racemes; standard striated on the outside; calyx smooth, with lanceolate segments. *Legumes* an inch long, turgid, almost cylindrical, sessile in the calyx, villous only when young. A native of the East Indies, on the coasts of Malabar and Coromandel. The natives call it Vatti quilliquel-pé, the plant that rattles, in allusion to the noise which the ripe pods make when shaken. β "Leaves hastate-lanceolate, very acute." Found by Commerçon in the Isles de France and Bourbon. γ . "Leaves ovate-lanceolate, larger." *Leaves* near five inches long, and two broad. *Flowers* in racemes from six to eight inches long, yellow; standard with purple streaks above; keel reddish-brown at the point. Found by Commerçon in the island of Java. La Marek thinks that these three plants, though differing so much in their foliage, are nothing more than varieties. 26. *C. semperflorens*. Willd. 16. Vent. Pl. Jard. Cels. Pl. 17. "Leaves oval, emarginate, mucronate; stipules crescent-shaped, embracing the stem; stem somewhat shrubby, cylindrical, striated." *Root* perennial. *Stipules* narrower than those of the preceding species. *Flowers* yellow. A native of the East Indies. 27. *C. hirsuti*. Willd. 17. "Leaves egg-shaped, acute; stipules awl-shaped, reflexed; raceme nearly terminal; legumes hirsute; stem hairy. *Root* annual. *Stem* two feet high, erect, nearly cylindrical, branched. *Leaves* two inches long, on short petioles, smooth above, slightly pubescent underneath. *Raceme* few-flowered. *Legumes* an inch long. A native of the East Indies, near Hyderabad. 28. *C. scandens*. Mart. 32. Lour. Cochinch. 433. "Leaves oblong; peduncles many-flowered, axillary; stem shrubby, climbing." A large shrub, with long, woody, climbing branches. *Leaves* acuminate, quite entire, alternate, smooth, petioled. *Flowers* white; calyx smooth; petals nearly equal, spreading. *Legume* turgid, acuminate at both ends, containing a few seeds. A native of Cochinchina. 29. *C. biflora*. Linn. Mant. 560. 570. Mart. 12. Willd. 18. (*C. nana*; Burm. Ind. 156. tab. 48. fig. 2. Lam. 15. *C. maderaspatana*; Pet. Gaz. tab. 30. f. 10. *Astragalus biflorus*; Mant. Alt. 273.) "Leaves oblong, obtuse, hairy; stems prostrate, herbaceous; peduncles two or three-flowered, axillary." Willd. *Stem* about three inches high, erect, cylindrical, hairy, terminated by the peduncle; branches, from the base of the stem, several, alternate, decumbent, simple, much longer than the stem. *Leaves* an inch long, alternate, obtuse, veinless, slightly hairy, on very short petioles. *Flowers* yellow; peduncles terminal, but on the branches they finally become lateral, by the branch extending itself beyond the flower; calyx with lanceolate segments; upper one bifid; banner egg-shaped, ascending, the length of the calyx; wings oblong, adpressed; keel bellied, beaked, gibbous downwards at the base; filaments all connate, alternately shorter; anthers five, rather oblong; five round, barren; stigma villous. *Legume* didymous-globular, inflated, becoming rather cylindrical in the cultivated plants. Found by Koenig in the island of Johanna. La Marek suspects that the *biflora* of Linnæus, or at least the *astragalus biflorus*, quoted as a synonym, is his *cicer nummularifolium* (see *CICER*), and altogether distinct from Burman's *C. nana*; but, if the fructification of his *nummularifolium* be, as he asserts, entirely that of *cicer*, its filaments must be diadelphous, and therefore it cannot be the plant now described. 30. *C. nummularia*. Willd. 19. "Leaves roundish-ovate, or lanceolate, hairy underneath; peduncles axillary, one or two-

flowered; stem procumbent." *Stems* several, a foot long, hairy, branched. *Leaves*, on most of the branches, orbicular, egg-shaped, half an inch long; on some lanceolate, almost an inch long. *Peduncles* four times the length of the leaves, hairy. *Legumes* four lines long, roundish-egg-shaped, obtuse, pubescent. A native of the East Indies. 31. *C. bifaria*. Linn. jun. Supp. 322. Mart. 15. Lam. 19. Willd. 20. "Lower leaves roundish; upper ones ovate-lanceolate; stipules reflexed; peduncle terminal, one-flowered." *Stems* diffuse, cylindrical, pubescent. *Leaves* in two opposite rows, on short petioles, widely spreading; stipules egg-shaped, tubular. *Flowers* bluish, rather large; peduncles erect, long, filiform; bractes two on the peduncle, near the flower, resembling the stipules. *Legumes* oblong, with a point hispid. Observed by Koenig in shady parts of the garden of the queen of Tanjour. 32. *C. opposita*. Linn. jun. Supp. 322. Mart. 13. Lam. 17. (*Spartium capense*; Linn. Sp. Pl. Liparia; Syst. Veg. ed. 13. *Cytisus capensis*; Berg. cap. 217. *Rafnia opposita*; Willd. 950. *Genista*; Herm. Afr. 11.) "Smooth, without stipules; leaves oblong, sessile; peduncles axillary, two-leaved." A shrub. *Stems* simple, (branched, Berg.) quite smooth. *Leaves* obtuse, erect, (two inches long or more, linear-lanceolate, Berg.) *Flowers* yellow, drooping, axillary towards the top of the stem; peduncles long, with two opposite bractes near the flower, which resemble the leaves of the stem; stamens diadelphous. A native of the Cape of Good Hope. Authors have been much at a loss what to do with this plant. It has already had several names; and La Marek presumes that it cannot be suffered to remain long in this genus, where the younger Linnæus has placed it. Willdenow has accordingly removed it to *rafnia*, taken up from Thunberg; but as we have not yet been able to make up our mind, with respect to that new genus, we have let it rest here for the present.

** *Leaves compound.*

33. *C. lotifolia*. Linn. Sp. Pl. 12. (misprinted *latifolia*.) Mart. 16. Lam. 20. Willd. 22. Dill. Elth. 121. tab. 102. fig. 121. (*C. trifolia fruticosa*; Sloan. Jam. 114. Hist. 2. 33. tab. 176. figs. 1, 2.) "Leaves ternate; leaflets inversedly egg-shaped, smooth; racemes lateral, few-flowered; legumes sessile in the calyx." *Stems* a foot or a foot and half high, slender, weak, cylindrical, hard and woody towards the base, tender, and herbaceous above; branches numerous. *Leaves* petioled; leaflets smooth, egg-shaped; stipules two at the base of each petiole, small, narrow. *Flowers* yellow; standard streaked with purple above; peduncles axillary, commonly shorter than the leaves, three or four flowered. *Legumes* inflated, slightly hairy. A native of Jamaica and South America. 34. *C. pubera*. Willd. 23. Vahl. Eclog. 2. 55. "Leaves ternate; leaflets oblong, obtuse, villous underneath; legumes in racemes, villous." *Root* perennial. *Branches* woody, cylindrical. *Leaves* petioled; petioles half an inch long, cylindrical; leaflets on very short petioles, acute at the base, without veins or nerves, pale green, mucronate; stipules awl-shaped, minute, deciduous. *Flowers* small, remote; racemes axillary and terminal, longer than the leaves; bractes minute, bristle-shaped; segments of the calyx lanceolate. *Legumes* scarcely half an inch long, oblong, pendulous. A native of the island of St. Martha. 35. *C. argentea*. Willd. 24. Jacq. Hort. Schoenb. 2. 50. tab. 220. "Leaves ternate; leaflets lanceolate, hoary; peduncles one-flowered, solitary; calyxes three-parted." A shrub, three feet high, with the habit of a coronilla, and zig-zag hoary branches. *Leaves* hoary; leaflets rather obtuse, shorter than the petiole. *Flowers* yellow, opposite to the leaves at the tops of the branches; calyx the length

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of the corolla. *Legumes* lanceolate, somewhat compressed. A native of the Cape of Good Hope. 36. *C. lunaris*. Linn. Sp. Pl. 13. Mart. 17. Lam. 22. Willd. 25. "Leaves ternate; leaflets egg-shaped, acute; stipules semi-sordate, crescent-shaped." *Stem* erect, filiform, branched, woody, zig-zag. *Leaflets* green, and smooth above; villous, whitish, and shining underneath, equal; sessile on the common petiole; stipules with the point directed to the leaf. *Flowers* towards the summit of the branches; peduncles one-flowered, opposite to the leaves, solitary; bractes three, awl-shaped, shorter than the calyx, forming a kind of involucre to each flower. A native of Africa. 37. *C. laburnifolia*. Linn. Sp. Pl. 14. Mart. 18. Lam. 23. Willd. 26. (*C. asiatica frutescens*; Herm. Lugb. 196. tab. 197. Rai. Hist. 1893. *C. arborefcens*; Burm. Zeyl. 82. tab. 35. Nella tandale-cotti; Rheed. Mal. 9. 49. tab. 27.) "Leaves ternate; leaflets egg-shaped, acuminate, smooth; stipules none; raceme terminal; legumes pedicelled." A shrub, three feet high or more, quite smooth, branched; branches slender, cylindrical, even-surfaced, leafy. *Leaves* on long petioles; leaflets green on both sides, slightly petioled. *Flowers* large, yellow, in long lateral racemes, a little below the summit of the branches; calyx rather short, especially the upper lip; keel larger than the other petals, compressed, much bent, with a reversed beak. *Legumes* smooth, inflated, hanging out of the calyx, by a pedicel at least an inch long, terminated by the curved style. A native of the East Indies. 38. *C. macrophylla*. Willd. 27. "Leaves ternate; leaflets oblong-ovate, pubescent underneath; racemes axillary, aggregate, shorter than the petiole." *Root* perennial. *Branches* cylindrical. *Leaves* alternate, on petioles two inches long; leaflets four inches long, three-nerved, veined, smoothish above, pubescent underneath; middle one narrowed at the base; the others oblique. *Racemes* an inch long, somewhat compound, numerous; calyx two-lipped; corolla falcate. *Legumes* half an inch long, oblong, acute, turgid, generally with one small, roundish seed. A native of the East Indies. A plant, with the habit of hedyfarum; but the flower and fruit of crotalaria. 39. *C. levigata*. Lam. 21. Willd. 28. "Shrubby, smooth; leaves ternate; leaflets oblong-elliptical, smooth; racemes lateral, few flowered; legumes pedicelled in the calyx." *Branches* woody, slender, cylindrical. *Leaves* small, alternate; leaflets only three or four lines broad. *Flowers* yellow, from two to four on an axillary peduncle, a little longer than the leaves, with an awl-shaped bracte. *Legumes* half an inch long, oval, inflated, terminated by the twisted reflexed style. Found by Commerfon in the island of Madagascar. 40. *C. trifolialstrum*. Willd. 29. "Leaves ternate; leaflets wedge-shaped, emarginate, shorter than the common petiole; racemes terminal." A plant with the habit of melilot. *Branches* two feet long, simple, cylindrical, erect. *Leaflets* an inch long, smooth above, clothed with adpressed hairs, when seen under a lens underneath; stipules bristle-awl-shaped. *Racemes* three or four inches long, terminal; sometimes with one or two-flowered axillary peduncles. *Flowers* yellow. *Legume* roundish, turgid, pubescent. A native of the East Indies. 41. *C. cordata*. Linn. Mant. 266. Mart. 19. Lam. 25. Willd. 30. (*Spartium sopheroides*; Berg. cap. 198. *Hypocalyptus obcordatus*; Thunb. Prod. 124.) "Leaves ternate; leaflets inversely heart-shaped, mucronate; flowers in corymbs; item shrubby." A shrub eight feet high; branches purple, somewhat angular, rugged with truncated scars. *Leaves* petioled; leaflets smooth, almost equal, petioled, nerved, plaited lengthwise, purplish above, glaucous underneath, the size of a finger nail; stipules bristle-shaped, minute. *Flowers* purple-violet; corymbs terminal, solitary. A native of the Cape of Good Hope. 42. *C. pilosa*. Willd. 31. Thunb. Prod. 125. "Leaves ternate, hairy; leaflets mucronate; flowers terminal." A native of the Cape of Good Hope. 43. *C. spicata*. (*C. villosa*; Willd. 32. Thunb. 125.) "Leaves ternate, villos; leaflets obtuse; spikes terminal." A native of the Cape of Good Hope. Another plant from the Cape of Good Hope, cultivated by Miller, having been previously called *C. villosa*. (See n. 20.) We have given a new name to the present. 44. *C. axillaris*. Willd. 33. Hort. Kew. 3. 20. "Leaves ternate; leaflets ovate-elliptical, hairy underneath; stipules awl-shaped, minute; peduncles axillary, in pairs, one-flowered." *Root* annual. *Branches* furrowed. *Leaves* alternate; leaflets acute, mucronate; stipules hairy. *Flowers* yellow. *Legumes* hairy. A native of Guinea. 45. *C. incanescens*. Linn. jun. Supp. 323. Mart. 21. Willd. 34. Hort. Kew. 3. 20. (*C. arborefcens*; Lam. 24. *C. capensis*; Thunb. 127. Jacq. Hort. 3. 36. tab. 64.) "Leaves ternate; leaflets inversely egg-shaped; stipules resembling the leaves petioled; racemes terminal; legumes pedicelled." A handsome shrub, five or six feet high, with the habit of a cytissus. *Stem* arborescent, with a greyish bark, much branched towards the top; branches short, leafy, cylindrical; covered with a fine, very short, whitish down. *Leaves* petioled; leaflets obtuse, green, on whitish petioles; stipules two, opposite, heart-shaped, deciduous, much smaller than the leaves. *Flowers* large; standard larger than the keel, recurved towards the peduncle, bright yellow, striped at the base, on the inside; spotted with purple brown on the back; wings bright yellow; keel pale, raised and greenish at the beak; filaments connate, but almost diadelphous; anthers oblong, saffron-coloured. A native of the Cape of Good Hope, and of the Isles of France and Bourbon. La Marek observes that as it is called in the Isle of France Baguenaudier, the French name for the bladder fenna (*Colutea*) of our English nursery-men, the legumes are probably much inflated. 46. *C. incana*. Linn. Sp. Pl. 15. Mart. 20. Lam. 26. Willd. 35. Jacq. Obf. 44. tab. 82. Swartz. Obf. 278. Cav. Ic. 4. 11. tab. 322. (*Anonis americana*, folio latiore subrotundo; Tourn. 409. *Crotalaria folis rotundis incanis*; Sloan. Jam. Hist. 2. 34. tab. 179. fig. 1.) "Leaves ternate, leaflets oval, villous underneath; racemes spike-shaped; keel tomentous at the edge; legumes sessile, hirsute." *Root* annual. *Stem* from two to five feet high, erect, almost simple, pubescent. *Leaves* petioled; leaflets obtuse with a small point; petioles pubescent; stipules bristle-shaped, solitary, deciduous. *Flowers* yellow, rather large, pedicelled; bractes filiform; one at the base and two at the top of each pedicle under the calyx; calyx pubescent, with lanceolate divisions. *Legumes* inflated, villos, pendant, sessile in the calyx. A native of the West Indies. Dombey sent from Peru in 1779, what appears to be a variety, with longer leaves, rather larger flowers, and a denser spike. 47. *C. purpurascens*. Lam. 27. (*C. indigofera*; Sounerat. Herb.) "Villos; leaves ternate; leaflets ovate-wedge-shaped, retuse, terminated with a minute point; standard of the corolla purplish above." *Root* annual. *Stem* from one to three feet high, erect, often simple, hard, cylindrical, covered with loose woolly hairs. *Leaves* green, nearly smooth on both sides; petioles villos like the stem; partial ones half a line long; stipules bristle-shaped, villos. *Flowers* small, yellow, drooping, in loose lateral racemes just below the top of the stem; calyx nearly as long as the corolla, villos, with narrow-lanceolate divisions; standard not reflexed; bractes villos. *Legumes* from twelve to fifteen lines long, inflated, villos, pendant, sessile in the calyx. A native of Madagascar and the Isle of France; cultivated at Paris. 48. *C. coluteoides*.

CROTALARIA.

scabres. Lam. 28. (Geniſæ ſimilis; Pluk. tab. 185. fig. 3. without the fruſtification.) "Leaves ternate; leaflets inverſely egg ſhaped; racemes looſe, terminal; legumes veſiculous, ſmooth, pedicelled, deſtitute of the ſtyle." *Branches* cylindrical, full of pith, ſmooth, leafy. *Leaflets* obtuſe, with a ſcarcely perceptible point, ſmooth above, thinly ſet with hairs underneath; petioles ſhorter than the leaflets. *Flowers* in looſe terminal racemes from one to three inches long; calyx ſhort; upper leaf truncated, biſid; lower one with three ſhort diſtant teeth; filaments connate in a cylinder more than two-thirds of their length. *Legumes* an inch long, ſmooth. Communicated by Sonnerat, it is ſuppoſed, from Africa. Cultivated at Paris. 49. *C. glycinea*. Lam. 29. (*C. aſiatica* hirſuta; Herm. Lugbd. App. 663. from the herbarium of Juſſieu; Rai. Hiſt. 1893.) "Villous; leaves ternate; leaflets oval, lateral ones gibbous outward." *Root* annual. *Branches* cylindrical. *Leaves* petioled; middle leaflet petioled, nearly inverſely heart-ſhaped, often obtuſe, with a very ſmall point; ſtipules ſmall, oval-acute. *Flowers* apparently red, drooping, in terminal racemes; calyx villous, with narrow-lanceolate diviſions; germ covered with woolly hairs. A native of the Eaſt Indies. 50. *C. uncinella*. Lam. 30. "Leaves ternate; leaflets egg-ſhaped; ſtipules none; legumes ſerotiform, ſilky, ſcarcely longer than their terminal hooked ſtyle." A very branching ſhrub, about a foot and half high. *Branches* ſlender, cylindrical, pubeſcent. *Leaves* alternate, petioled; leaflets ſmooth above, clothed with fine and cloſe preſſ'd hairs underneath; middle one as long as the common petiole. *Flowers* ſmall, in lateral and terminal racemes; calyx villous; peduncles almoſt filiform. *Legumes* about the ſize of a pea, clothed with a fine ruſſet down. A native of the iſland of Bourbon, preſerved in the herbarium of Commerſon. There is a variety in the herbarium of Juſſieu ſmooth in all its parts, with ſmaller leaves and yellow flowers, the ſtandard ſlightly ſtriated behind, the keel bent and terminated by a ſtraight beak as in the next ſpecies. There is another variety from Madagaſcar, preſerved in the herbarium of Commerſon, with much larger ſmooth fruit. And a third in Adanſon's herbarium of Senegal, now poſſeſſed by Juſſieu, with villous ſmaller leaves, and villous ſomewhat larger legumes. 51. *C. medicaginea*. Lam. 31. "Leaves ternate; leaflets cordate-wedge-ſhaped; keel horned; legumes ſerotiform, ſhorter than their terminal reflexed ſtyle." A plant with the habit of medicago polymorpha. Linn. *Branches* ſomewhat woody at the baſe, very ſlender, cylindrical, compound, clothed with ſhort hairs, cottony near the ſummit. *Leaves* alternate, very ſmall; leaflets clothed with ſhort depressed hairs underneath, a little longer than the common petiole; ſtipules very ſmall, awl ſhaped. *Flowers* very ſmall, from three to five together; peduncles lateral, filiform, oppoſite to, and longer than the leaves; calyx villous, with five lanceolate diviſions; keel bent nearly at a right angle, terminated by a long, conical, ſtraight horn, a little twisted at the top; ſtandard ſhorter than the keel, and reſting upon it, pubeſcent and ſtriated on the back. *Legumes* ſcarcely the diameter of a lentil, pubeſcent. A native of the Eaſt Indies, communicated by Sonnerat. 52. *C. ſforaloides*. Lam. 32. "Leaves ternate; leaflets oblong, obtuſe, longer than the petiole; ſpikes axillary, ſlender, elongated." *Stem* apparently a foot and half or two feet high, ſomewhat zig-zag, obtuſely angular, full of pith, tomentous towards the top. *Leaves* alternate, on very ſhort petioles; ſtipules lanceolate, the length of the petioles. *Flowers* ſmall, ſeſſile; bractes bristle-ſhaped. *Legumes* oval-rhomboidal, ſlightly inflated, villous, terminated by the recurved ſtyle. Found by Commerſon in the iſland of Madagaſcar. 53. *C. pallida*. Mart. 26. Willd. 30. Hort. Kew. 3. 20. "Leaves ternate; leaflets lanceolate, ſmooth; racemes terminal, reſembling ſpikes." *Root* annual. *Flowers* pale-coloured. A native of Africa, found by Bruce. 54. *C. longifolia*. Lam. 33. Willd. 37. (*C. guianenſis*; Aubl. guian. 2. 761. tab. 305.) "Leaves ternate; leaflets lanceolate, ſmooth; p. duncies axillary, aggregate, one-flowered; legumes tetragonal." *Root* perennial. *Stems* a foot high or more, angular, leafy, with ſhort branches. *Leaves* alternate, on very ſhort petioles; leaflets four or five inches long, near an inch broad, nerved, veined, middle one longer, ſlightly petioled; ſtipules, two at the baſe of each common petiole, lanceolate; two at the baſe of each leaflet, rather long, very acute. *Flowers* purple, from two to four together, on very ſhort peduncles; calyx long, enveloped at its baſe by two bracteal ſcales. *Legumes* ſmooth, inflated, oblong, acute. A native of Guiana. 55. *C. anguſtifolia*. Willd. 38. Jacq. Hort. Schoen. 2. 49. tab. 219. (*C. elongata*; Thunb. prod.?) "Leaves ternate; leaflets lanceolate, hoary, ſilky, ſhorter than the petiole; raceme terminal." *Root* perennial. *Raceme* three inches long. *Flowers* dull white. A native of the Cape of Good Hope. 56. *C. lineata*. Lam. 34. Willd. 39. Thunb. prod.?" "Leaves ternate; leaflets linear-lanceolate, on ſhort petioles, villous, marked with lines; legumes ſhort, hirſute, in racemes." Lam. "Leaves ternate, tomentous underneath; nerved; ſtem decumbent." Thunb. A ſhrub. *Branches* cylindrical, ſtriated, cottony towards the ſummit. *Leaves* alternate; petioles ſcarcely a line long, villous; leaflets from one to two inches long, about four lines broad, villous, with numerous lateral nerves; middle one a little longer, ſomewhat petioled; ſtipules two, lanceolate. *Flowers* from five to nine in a raceme, alternate, ſeſſile. *Legumes* four or five lines long, inflated. Communicated to La Marek by Juſſieu. Thunberg's plant is a native of the Cape of Good Hope. 57. *C. tomentosa*. (*C. geniſtoides*; Willd. 40.) "Leaves ternate; leaflets linear-wedge-ſhaped, emarginate; raceme terminal." Whole plant pubeſcent. *Branches* ſomewhat woody, compound. *Leaves* on a very ſhort common peduncle; ſtipules awl-ſhaped. *Flowers* ſmall, yellow. *Legumes* half an inch long, roundiſh egg-ſhaped, acuminate. The habit of a geniſta. A native of the Eaſt Indies. Willdenow ought to have obſerved that the trivial name *geniſtoides* was pre-occupied by La Marek, whoſe work was certainly before him, though he did not chuſe to take up many of its peculiar ſpecies, even ſome which are deſcribed from living plants by ſo eminent a botaniſt. 58. *C. floribunda*. Mart. 24. Hort. Kew. 3. 19. "Leaves ternate; leaflets wedge-ſhaped; branches pubeſcent; legumes pedicelled, ſmooth, wrinkled, keeled." *Root* perennial. A native of the Cape of Good Hope. 59. *C. microphylla*. Willd. 41. Vahl. Symb. 1. 52. "Leaves ternate; leaflets oblong; peduncles lateral, two-flowered; ſtem decumbent." *Stem* a foot long, woody, filiform, cylindrical, ſmooth, branched. *Leaves* petioled, remote; leaflets two lines long, nearly ſeſſile, ſmooth, thickiſh; common petiole the length of the leaves; ſtipules bristle-ſhaped, ſpreading, half the length of the petiole. *Flowers* pedicelled. *Legume* oblong, ſmooth, on a very ſhort pedicel. A native of Arabia Felix. 60. *C. volubilis*. Willd. 42. Thunb. prod. 125. "Leaves ternate; leaflets ſmooth, inverſely egg-ſhaped, obtuſe; flowers axillary, ſolitary." A native of the Cape of Good Hope. 61. *C. heterophylla*. Linn. jun. Supp. 323. Mart. 22. Lam. 35. Willd. 43. "Leaves ternate; leaflets elliptical, emarginate; lower leaves ſimple." *Root* annual. *Stem* a foot high, erect, ſmooth, a little branched near the top. *Leaves* ſmooth, nerved, on very ſhort channelled petioles; ſtipules ſmall, awl-ſhaped, ſpreading. *Flowers* yellow, ſtriated, in a terminal

a terminal raceme, which becomes lateral as the fruit ripens. *Legumes* smooth. A native of the East Indies. 62. *C. appalahoïdes*. Lam. 36. "Leaves ternate, petioled; leaflets wedge-linear, hirsute; stipules none; racemes peduncled, terminal." A shrub, scarcely a foot high." *Stem* woody, twisted, stiff, rugged, branched; smaller branches slender, cylindrical, leafy, pubescent, whitish. *Leaves* small, narrow, hairy. *Flowers* pedicelled, from three to six in a raceme, on a very slender peduncle; calyx villous; keel crescent-shaped; filaments at first entirely connate; but afterwards dividing at the top; germ very villous; style at first hooked, afterwards curved and ascending; stigma simple. A native of the Cape of Good Hope. 63. *C. quinquefolia*. Linn. Sp. Pl. 17. Mart. 23. Lam. 37. Willd. 44. (*C. pentaphylloides*; Pluk. alm. 122. Welha-tandall-cotti; Rheed. Mal. 9. tab. 28. Rai. Supp. 465.) "Leaves digitate-quinuate; flowers in racemes." A plant with the habit of a lupin. *Root* annual. *Stem* about two feet high, erect, rather thick, striated, slightly villous. *Leaves* alternate, petioled; leaflets five, oblong, obtuse, rather narrow, the side ones the shortest; upper surface sprinkled with very small black points, clothed with short fine hairs underneath; stipules narrow, nearly awl-shaped, reflexed. *Flowers* yellow. *Legumes* two inches long, much inflated, vesicular, smooth, pedicelled in the calyx, terminated by the recurved reflexed style. A native of the East Indies, and the Isle of France, described by La Marek from specimens gathered by Commerçon. 64. *C. heptaphylla*. Mart. 31. Lour. Cochinch. 443. "Leaves pinnated with seven leaflets; spikes long; stem arborescent." A tree, ten feet high, with diffuse branches. *Leaflets* ovate-oblong, veined, slightly tomentous; petioles short. *Flowers* white, axillary, and terminal, in simple solitary spikes; calyx five-toothed, villous, short; standard emarginate, rising; rings oblong, half the length of the standard. *Legume* turgid, villous, unequal, pedicelled. *Seeds* few, roundish. A native of Cochinchina.

CROTALARIA asarina; Berg. See *GLYCINE monophylla*.

CROTALARIA perforata; Linn. See *BORBO니아 perforata*.

CROTALARIA zeylanica argentea totia; Herm. See *SOPHORA tomentosa*.

Oof. From only a cursory survey of the descriptions in the above numerous list, it is but too evident, not only that some of the species do not correspond with the genuine character as it now stands, even after the very liberal modifications which we have given it; but also that it would not be easy, perhaps not possible, to include them all in any precise generic character whatever. Jussieu has observed that this genus wants revival, and that some of the present species ought to be removed. La Marek has accordingly removed *imbricata* (n. 19.), to *borbonia*, and thinks that *perfoliata*, *amplexicaulis*, and *reniformis* (n. 1, 2, 3.), might with propriety follow it. Willdenow has arranged the three former of these, and some others, under Thunberg's new genus, *rasnia*. But were we to admit the propriety of this disposition, so much would still remain to be done, that we have been induced to leave the genus as we found it. In the course of our labours we often painfully feel the truth of La Marek's observation, that those who write general botany in an alphabetical order, cannot have entire natural families before them at once, and that, therefore, they can seldom do more than suggest their doubts, without being able positively to determine what station should be assigned to a plant which seems to be improperly placed. A complete reformation of the genera in all the great universally acknowledged natural families, adapted to the multitude of species, which, within a few years, have poured in upon us from every quar-

ter of the world, is indeed a task to which the unremitted attention of a whole life would scarcely be equal.

Propagation and Culture.—Most of these plants are cultivated by seeds, sown in a hot-bed in the spring, and afterwards treated in the usual manner. Those which are natives of the Cape will be sufficiently protected by the conservatory or dry stove; but such as come from the East Indies and West Indies, and the hotter parts of Africa, must be kept in the bark stove. *C. laburnifolia* (n. 37.) is easily propagated by cuttings.

CROTALARIA, in *Gardening*, comprehends plants of the herbaceous and shrubby exotic kinds, of which the species cultivated are, the channel-stalked *crotalaria* (*C. juncea*), and the laburnum leaved *crotalaria* (*C. laburnifolia*.)

Method of Culture.—The first kind of these plants may be increased by sowing the seeds in pots of light mellow fresh mould in the spring, plunging them in the hot bed of the stove; and when the plants are of sufficient growth, removing them into separate pots.

The second sort may be raised either by seeds in the above manner, or by planting cuttings of the young branches in the later spring months, in pots of the same sort of earth, and plunging them in the bark-beds of the stove, giving them water frequently, and removing them when well rooted into separate pots, of proper sizes.

These plants are capable of being exposed to the open air during a little of the heat of the summer season, but at other times stand in need of the protection of the hot-house or stove.

CROTALO, an instrument of military music. (See *CROTALUM*.) The Turks are the first, among the moderns, who introduced the use of it for their troops. It is now common in Flanders and Florence, and other territories on the continent. It has only one tone; but its effect in marking time may be distinctly heard through the noise of forty drums. This is the same instrument with the ancient *cymbalum*.

CROTALOPHORUS ANGUIS, in *Zoology*, the name used by the generality of authors for the *rattle snake*. See *CROTALUS*.

CROTALOPHORUS anguis, is also the name of a very remarkable species of serpent, more usually known by the name of *cobra de capello*.

CROTALUM, an ancient kind of castagnetta, or musical instrument, found on medals, in the hands of the priests of Cybele.

The *crotalum* differed from the *xylyrum*; though authors frequently confound the two. It consisted of two little brass plates, or rods, which were shaken in the hand, and in striking against each other made a noise.

It was sometimes also made of a reed split lengthwise half-way down; one part whereof they struck against the other; and as this made a noise something like that of a crane's bill, they called that bird *crotalifris*, a player on the *crotale*; and Aristophanes calls a great talker a *crotalum*.

Clemens Alexandrinus attributes the invention to the Sicilians; and forbids the use thereof to the Christians, because of the indecent motions and gestures that accompany it.

Pausanias relates, that Hercules did not kill the Stymphalides with his arrows, but that he frightened and drove them away with the noise of the *crotala*, which shews, admitting the truth of the relation, that the *crotalum* must have been a very ancient instrument. Ovid joins the *crotalum* with the *cymbals*.

"Cymbala cum crotalis prurientiaque arma Priapo
Ponit, et adducit tympana pulsa manu."

CROTALUS.

CROTALUS, in *Zoology*, a genus of serpents, having plates on the belly, both plates and scales under the tail, and the tail itself terminated by a rattle.

These are the rattle-snakes of the English, and serpens à sonnettes of the French, or, as some writers among the latter call them, *crotalophores*. The whole genus is furnished with poisonous fangs. Their head is large, somewhat triangular, rather flat on the upper part, and, like the body, covered with carinated scales, but which in general are of a larger size; the eyes are very brilliant, and protected by a nictitant membrane; the mouth large, and capable of great distension; the tongue long, furcated at the extremity, and susceptible of a brisk vibratory motion. The venomous fangs are placed in two longitudinal rows, in the upper part or roof of the mouth: the largest of those fangs stand foremost, from whence they progressively become smaller as they recede further back in the mouth, and are usually fourteen in number altogether, seven being disposed in each series. Each of those have two small fissures, one at the base, the other a little above the tip, through which the venom is discharged into the wound, by pressing on the poison bags at the base of the fangs. This poison is of a greenish colour, and the larger fangs in rattle-snakes of considerable size about half an inch long.

The rattle is a peculiar instrument ordained by nature to announce the approach of this formidable serpent to other animals, and warn them of their danger. Till the discovery of America, such extraordinary powers in the reptile race were unknown to the inhabitants of our hemisphere; and from that period to the present they have attracted the particular attention of naturalists. The rattle is a moveable apparatus of a horny texture, and consisting of a greater or smaller number of joints, which, as the creature moves, sends forth a peculiar jarring sound, not very unlike that of a child's rattle. The number of its joints vary not only in different species, but in individuals of the same species; and seem, if any dependance can be placed on the veracity of travellers, to be governed in a great measure by the age and health of the animal. Some believe the age of these snakes may be constantly ascertained by the number of those joints, one being added annually; and hence they are supposed to attain to a great age, as rattle-snakes have been found with no less than forty or even fifty joints in this part. Some of the Indians deny this, and assert that the amount of those joints in the rattle determines the number of human beings that have fallen victims to the deadly fangs of those hideous creatures. A particular account of the structure of the poisonous fangs of the rattle-snake is given in the *Philosophical Transactions* by Dr. Grey; and a copious description of the rattles of different species has lately appeared by La Cèpede.

The noise of the rattle-snake is said to be rather feeble in general, and of course not very distinctly heard till the creature approaches pretty near. This we suspect from what we have observed of the rattle-snakes brought over to Europe. Those, indeed, having endured the want of proper subsistence for months, and being in a state of captivity, cannot be supposed to afford any absolute criterion; but from these we may presume that the noise is not so loud as some travellers represent. Once we had an opportunity of hearing the noise of three rattle-snakes of the striped or durissus species, confined in the same cage: it was an incessant rattling hum, distinct enough in any part of the room, which was moderately large, but not so strong or piercing as to be heard at a much greater distance.

Almost every animal becomes panic struck at the sight of the rattle-snake, and seems at once deprived of the power of

motion, or the exercise of its usual instinct of self-preservation. Horses and dogs are momentarily arrested in their progress, and wait, without attempting to move, the nearer approach of the terrific creature, unless driven by man with force from the immediate danger. From what cause this torpor in animals may arise, when the serpent advances and threatens destruction, is difficult to say, except it be the effect of terror. The fascinating power attributed to serpents does not admit of much credit: we should suspect rather that they become stupefied with horror at their danger, and are unable through fear to attempt escaping till the snake inflicts its wound, when escape is too late. The snake remains quiet till his victim expires, and then proceeds in security to devour it. That this does not depend on the power of fascination, as it is expressed, in snakes may be in some measure inferred, from considering that the most stupid of all animals are more likely to get out of their power than those whose instinctive penetration, on other occasions, might most readily enable them to avoid difficulties. Thus we see that horses and dogs fall a prey to the rattle-snake, through their acute sense of danger; while the hog, stupid and indifferent, and scarcely possessing the instinct to turn a few paces aside to avoid almost certain destruction, approaches the rattle-snake with impunity, or seeks him in his covert, attacks him, tramples on him, and devours him.

Man or animals bitten by the rattle-snake expire in extreme agony: the tongue swells to an enormous size; the blood turns black; and all the extremities becoming cold, gangrene ensues, and is speedily succeeded by death. The remedies in common use are the polygala feneca, or aristolochia serpentaria, employed as a decoction, and applied in fomentation as hot as can be possibly borne; or sometimes scarification, or cauterising the wound with a burning iron, if immediate in their application, is attended with success: and in either case, if the situation of the wound will allow, it is necessary to retard the circulation of the venom through the system, by means of ligatures. The rattle-snakes have an offensive smell, notwithstanding which the negroes eat the flesh like that of other serpents; and they have a superstitious idea, that the rattles, as a *charm*, are of sovereign efficacy to women in child-birth.

The different kinds of rattle-snakes seem to have been confounded with each other till of late years. Gmelin makes five distinct species, in which he is followed by the writers of this country. To these, however, Latreille adds three more, which he describes from specimens in the National Museum at Paris. These are his *crotale à losange*, *crotale à queue noire*, and *crotale camard*: the two first of these are natives of America, the other is from the East Indies. It is believed that two of the above number have been previously noticed by Seba, but whose description, if it be really so, is much less explicit than the account rendered from the specimens in the French Museum by Latreille.

Species.

HORRIDUS. Fuscous, with blackish transverse bands. Plates of the belly 167, of the tail 23.

This species is found from three to four or five feet in length, some say even six feet, and the thickness of a man's arm. We once saw the skin of a rattle-snake, which, when perfect, measured, as it was affirmed, eleven feet six inches, and in the girth appeared to be about the thickness of a man's thigh; it was, therefore, in dimensions, equal to some of the largest box. The general colour of the rattle-snake is yellowish-brown, marked throughout its length with a number of transverse, and somewhat irregular, bands

of deep brown; and from the head to some distance down the neck run two or three longitudinal stripes of the same colour. The under parts are of a dingy yellowish-brown colour, with dusky spots and freckles; the rattle at the end of the tail brownish.

The largest rattle-snake which Catesby ever saw (and he travelled over those parts of America in which they most abound) was about eight feet in length, and weighed between eight and nine pounds. "This monster," says he, "was sliding into the house of colonel Blake of Carolina, and had certainly taken up his abode there undisturbed, had not the domestic animals alarmed the family with their repeated outcries. The dogs and poultry united in their hatred to him, shewing the greatest consternation, by erecting their bristles and feathers, and expressing their wrath and indignation, surrounded him, but carefully kept their distance; while he, regardless of their threats, glided slowly along." "It is not uncommon," adds Mr. Catesby, "to have come into houses: a very extraordinary instance of which happened to myself in the same gentleman's house, in the month of February, 1723. The servant, in making the bed in the ground-room (but few minutes after I left it), on turning down the sheets, discovered a rattle-snake coiled between the sheets in the middle of the bed." "They are the most inactive and slow moving snake," adds this author, "of all others, and are never the aggressors, except in what they prey upon; for unless they are disturbed, they will not bite; and when provoked, they give warning by shaking their rattles. These are commonly believed to be the most deadly serpent of any in these parts of America. I believe they are so, as being generally the largest, and making a deeper wound, and injecting a greater quantity of poison. The most successful remedy the Indians seem to have is to suck the wound, which, in a slight bite, has sometimes a good effect. They have likewise some roots, which they pretend will effect a cure, particularly a kind of asarum, commonly called heart-snake-root; a kind of chrysanthemum, called St. Anthony's cross; and some others: but that which they rely on the most, and which most of the Virginian and Carolina Indians carry dry in their pockets, is a small tuberous root, which they procure from the remote parts of the country. This they chew, and swallow the juice, applying some to the wound." Mr. Catesby having, by travelling much among the Indians, had frequent opportunities of seeing the direful effects of the bite inflicted by these snakes, seems to consider that the good results attributed in common to these remedies is owing more to the force of nature, or the slightness of the bite, than to any other cause. He has known persons bitten to survive, without any assistance, for many hours: but where a rattle-snake with full force penetrates with his deadly fangs into a vein or artery, inevitable death ensues, and that, as he has often seen, in less than two minutes. The Indians, for this reason, know their destiny directly they are bit; and when they perceive it is mortal, apply no remedy, concluding all efforts in vain: if, however, it happens in a fleshy part, they cut it out to stop the current of the poison.

The charming, as it is commonly called, or attractive power this snake is said to have of drawing to it small animals, and devouring them, Mr. Catesby says, is generally believed in America. He allows that he never witnessed the fact; but that a great number of persons, by whom the circumstance had been related, agreed exactly in the manner in which the effect is produced. Little birds, and quadrupeds of a small size, particularly squirrels, (on which these snakes chiefly prey,) no sooner perceive their mortal enemy than they skip from spray to spray, hovering and approach-

ing gradually nearer to him, regardless of any other danger, and with distracted gestures and outcries descend, though from the top of the loftiest trees, to the mouth of the snake, who opens his jaws, takes them in, and in an instant swallows them. In a memoir on the supposed fascinating power of the rattle-snake, by Dr. Barton, professor of natural history in the university of Pennsylvania, it is however contended to be nothing more than the fluttering of old birds in defence of their young, when they perceive the snake lying in wait for prey, and which are themselves caught, as well as their young, by the rattle-snake, unless they save themselves by a timely retreat.

Rattle-snakes are said to swarm in the less inhabited parts of America, but are now almost extirpated in the neighbourhood of populous places. None are found further north than the mountains near lake Champlain, but they infect South America even as far as Brazil. They love woods and lofty hills, especially where the strata are rocky or chalky. The pass near Niagara abounds with them. Being slow of motion, they frequent the sides of hills to seize on frogs, or such animals as resort there to quench their thirst. During summer they are generally found in pairs; in winter, assembled together in multitudes, and lurking under ground, where they remain till the return of fine weather, when they creep out of their hiding-places in a weak and languid state. A person has seen a piece of ground covered with them, and killed with a long rod between sixty and seventy, till overpowered with the stench, which is dreadfully offensive, he was obliged to retire.

The rattle-snake is a viviparous animal; producing its young in the month of June, generally about twelve in number, and which by September acquire the length of twelve inches. It is said to protect its young in the same manner as the common viper, namely, by receiving them into its mouth, and swallowing them. This is asserted by M. de Beauvois, who saw a large rattle-snake, which he happened to disturb in his walks, coil itself up, open its jaws, and instantly receive five small ones, which were lying by it, and instinctively rushed into its mouth. M. de Beauvois retired, and watched the snake, and in about a quarter of an hour after saw her again discharge them. He then approached a second time, when the young retired into its mouth with greater celerity than before; and the snake immediately moved off among the grass, and escaped. This happened at a place called Pine-Log, where the writer staid some time with the Indians, during an illness with which he was seized. This circumstance is related in the American Philosophical Transactions.

From experiments made in Carolina by captain Hall, and related in the Philosophical Transactions, it appears that a rattle-snake of about four feet long, being fastened to a stake fixed in the ground, bit three dogs: the first of which died in less than a quarter of a minute; the second, which was bitten a short time afterwards, in about two hours, in convulsions: and the third, which was bitten about half an hour afterwards, shewed the visible effects of the poison in about three hours, and died likewise. Four days after this, another dog was bitten, which died in half a minute; and then another, which died in four minutes. A cat, which was bitten, was found dead the next day. Eight days after this, a frog was bitten, which died in two minutes; and a chicken of three months old in three minutes. The experiments having been discontinued some time, from want of subjects, a common black snake was procured, which was healthy and vigorous, and about three feet long. It was brought to the rattle-snake, when they bit each other: the black snake biting the rattle-snake so as to make it bleed.

They were then separated, and in less than eight minutes the black snake died; while the rattle-snake, on the contrary, shewed no signs of indisposition, appearing as well as before. Lastly, in order to try whether the rattle-snake could poison itself, it was provoked to bite itself: the experiment succeeded, and the animal expired in less than twelve hours. According to the experiments of Vossnaer at the Hague, with a lively young rattle-snake, which he received from Surinam, small birds, such as sparrows, finches, &c. died sometimes in four, sometimes ten, and sometimes twenty minutes after being bitten; and a mouse in a minute and a half.

The peculiar apparatus, called the rattle, in this kind of snake, is minutely described by Grew; who observes, that it consists of hollow, hard, dry, and semi-transparent bones, nearly of the same size and figure; resembling, in some degree, the shape of the human os sacrum; for although only the last or terminal one seems to have a rigid epiphysis joined to it, yet have every one of them the like, so that the tip of every uppermost bone runs within two bones below it; by which artifice they have not only a moveable coherence, but also make a more multiplied sound: each bone hitting against two others at the same time. The rattle is placed with the broad part perpendicular to the body, and not horizontal; and the first joint is fastened to the last vertebra of the tail by means of a thick muscle under it, as well as by the membranes, which unite it to the skin. All the remaining joints are so many extraneous bodies, as it were, or perfectly unconnected to the tail by any other means than their curious interfections into each other.

DURISSUS. Brown, with yellowish rhomboid stripes. Abdominal plates 172, subcaudal scales 21. *Crotalus durissus*, Linn.

This species is distinguished from the former by the different disposition of its colours. The lighter colour is pale yellow, marked along the back with a series of large black rhombic spots, and on each side with another series, similar in size and form, but not so deep in colour; and most of these have the disc white. The lower surface is dusky yellowish-brown, with numerous small dark spots and patches.

The general size of this snake agrees with that of the species horridus, with which it has been oftentimes confounded; more especially as it inhabits the same parts of America, and much resembles it in colours, though not in the disposition of its pattern. Its bite is equally fatal with that of the first-mentioned kind. Three varieties of this snake are mentioned by writers, which differ in the number of abdominal plates and caudal scales.

MILIARIUS. Cinereous, with a triple row of black spots, and a red spot between each of the dorsal ones. Abdominal plates 132, subcaudal scales 32. *Crotalus miliarius*, Linn. Small rattle-snake, Catesby.

Described by Catesby as a probable variety of the common rattle-snake. It is, however, now considered as a distinct species. In its general habits it resembles the preceding kinds, but is the smallest of the rattle-snakes known, rarely exceeding the length of two feet.

DRYINAS. Greyish variegated with yellow. Abdominal plates 105, subcaudal scales 50. *Crotalus dryinas*, Linn. *Vipera caudifona ceilanica*, Seba.

Seba describes this species as a native of America, but erroneously, as it is supposed; the whole genus appearing to be confined to the American continent. There is a specimen of this in the Parisian Museum.

MUROS. Back with black rhombic concatenate spots; tail terminated in a quadruple row of very minute sharp scales. Gmel.

This is a native of Surinam, is very large, and armed with fangs of vast size. It can scarcely be considered with propriety as belonging to this genus.

LE CROTALE A QUEUE NOIRE. Tail black. Abdominal plates 116, subcaudal scales 36.

Described by Latreille, who observes that it measures from three to four feet in length. The back is reddish-grey, speckled with brown, and marked with brown irregular angular bands; and a streak of fawn colour down the back. The species is a native of Carolina.

LE CROTALE A LOSANGE. Yellowish-grey, with two zig-zag lines of reddish brown along the back, forming by their angles a series of lozenge spots. Latreille.

A native of America. Described as a new species, from a specimen in the Paris Museum.

LE CROTALE CANARD. Head obtuse; body greyish, with numerous black spots and lines upon the back and sides. Latreille.

A specimen of this species, between two and three feet in length, is preserved in the Natural History Museum at Paris.

CROTALUS, in *Ancient Geography*, a river of Italy, in the Locride territory, now called *Corace*. M. d'Anville places it in Brutium.

CROTALYSTRIÆ, or **CROTALISTRÆ**, in *Antiquity*, a kind of morrice dancers, admitted to entertainments, in order to divert the company with their dancing, and playing on an instrument called crotalus, whence they had their name. By an ancient poem, entitled "Copa," and ascribed by some to Virgil, it appears that those who played with the crotala danced at the same time. In these dances, performed chiefly by women, they practised a variety of wanton gesticulations and indecent attitudes and postures, so that these, as well as cymbals, were banished from the festivals of all Christians.

CROTAPHITES MUSCULUS, in *Anatomy*, a name sometimes applied to the temporal muscle. See **MASTICATION**.

CROTAPHIUM, in *Medical Writers*, is used for a pain in the head. See **HEAD-ACH**.

CROTCH, in *Rural Economy*, a term which is often provincially applied to signify a sort of hook.

CROTCHES, **CROCCIA**, in *Sea Language*, a name given to those crooked timbers that are placed under the keel, in the fore and hind-parts of a ship, upon which the frame of her hull grows narrower below, as it approaches the stem afore, and the stern-post abaft.

CROTCHES are also certain pieces of wood or iron, whose upper parts open in two horns, or arms, like a half-moon. They are fixed in the different parts of a ship, according to the uses for which they may be designed, which is usually to support the spare-matts, yards, &c.

CROTCHET, in *Midwifery*, an instrument used in extracting or drawing a fetus through the vagina, when the pelvis in the woman is so distorted, or straightened, as to make it impossible for it to pass in its entire and perfect state. In these cases, the head of the fetus is always previously opened, and the brain evacuated, to allow the bones of the cranium to collapse.

The crotchet appears to have been used for this purpose, from a very early period, as we find it described under the name of uncus, or a hook, by Hippocrates, and afterwards by Celsus, and by Aboecasis. Originally it consisted of a straight piece of iron, one end of which was turned down, forming a hook. The part turned down was made sharp, and fashioned like the head of a spear; which form it still retains. See *Plate of Midwifery*. In later times a wooden

a wooden handle has been added, as more convenient for the operator. About the middle of the last century, Mons. Levrett recommended curving the stem of the crotchet, which added much to the power, and to the utility of the instrument. He also advised using two blades, one to be applied on each side of the head of the child; but this is neither necessary, nor often practicable, as in cases requiring the use of the crotchet, the pelvis of the woman is too narrow to admit the introduction of a second blade. The cases in which the crotchet is employed, and the manner of using them, are described under the article LABORIOUS or DIFFICULT BIRTHS.

CROTCHET, in *Musical*, one of the notes, or characters of time, marked thus  equal to half a minim, and double a quaver.

It is not easy to conceive how this character comes by the name crotchet: the word is apparently borrowed from the French *crochet*, of *croc*, a *crook* or *hook*, used by them for what we call the *quaver*, or *half crotchet*; by reason of the additional stroke at bottom, which gives it an appearance of a crook.

A dot added to the crotchet, thus  increases its time by half; that is, makes it equal to a crotchet and a half, or to three quavers.

CROTCHET, in *Printing*, denotes a sort of line, sometimes straight, sometimes waved, but always turned up at each extreme: serving to bind or link together several articles, that are to be read together, before you proceed to the subdivisions, placed aside of them with similar or smaller *crotchets*; much used in genealogies, analytical tables, &c. for facilitating the division and subdivision of any subject.

CROTCHETS are also used for two opposite characters, serving to inclose what we call a *parenthesis*, or any other part of a discourse to be distinguished from the rest of the work; sometimes in this form [], and sometimes in this ().

CROTENAY, in *Geography*, a town of France, in the department of the Jura, and district of Poligny; 2 leagues S. E. of Poligny.

CROTENDORF, a small town of Saxony, in the circle of the Erygerbirge, with about 1000 inhabitants, famous for its quarries of beautiful white marble, which have furnished the marble for the interior ornaments of the king's catholic chapel at Dresden, for the statue of the king, and for the monument erected to the celebrated Gellert in Wendler's garden at Leipzig. The marble ornaments of the far famed town's hall of Amsterdam, have also anciently been furnished by the Crotendorf quarries, and it is but about twenty years ago that they have yielded astonishing large blocks for the monument erected at Zell in Hanover, to the late unfortunate queen Matilda of Denmark, sister to Geo. III. of England. The Crotendorf marble quarries were discovered between 1588 and 1593, by Joseph Maria Nossen. They are nearly 20 English miles in extent.

CROTON, in *Botany*, (*κροτων*, Distc.) Linn. Gen. 1083. Schreb. 462. Willd. 1718. Gært. 624. Juss. 389. Vent. 3. 496. (Ricinioides; Tourn. 423.) Class and order, *monocia monadelphia*. Nat. Ord. *Tricocæ*; Linn. *Euphorbia*; Juss. *Tithymaloides*; Vent.

Gen. Ch. Monoicous, rarely dioicous, or polygamous. *Male flowers*. *Cal.* Perianth either one-leaved, five-toothed, or five-cleft; or with five or more leaves. *Cor.* Petals five,

scarcely larger than the calyx; or none. *Nectary*: five small glands, inserted into the receptacle. *Male flowers*. *Stam.* Filaments from about five to fifteen, or more, the length of the flower, most commonly connected at the base; anthers roundish, didymous. *Female flowers*. *Cal.* Perianth of five leaves or more. *Cor.* Petals five, or more frequently none. *Pist.* Germ superior, roundish; styles three or more, generally bifid; stigmas simple or cleft. *Peric.* Capsule roundish, three-lobed at the sides, three-celled; cells two-valved. *Seeds* one in each cell.

Eff. Ch. Male and female flowers separate. Male. Calyx with at least five leaves or five divisions. Stamens from five to fifteen, or more. Female. Calyx of five leaves or more. Styles three or more. Capsule three-celled. Seeds solitary.

* *Stem woody.*

Sp. 1. *C. variegatum*. Linn. Sp. Pl. 3. Mart. 1. Lam. 1. Willd. 1. (*Codiaeum chrysofolium*; Rumph. Amb. 4. 65. tab. 25. Tjere-maram; Rheed. Mal. 6. 109. tab. 61. β . Rumph. tab. 26. γ . tab. 27.) "Leaves lanceolate, quite entire, smooth, variegated, petioled." A shrub, five or six feet high, with the habit of nerium oleander. *Branches* cylindrical, smooth, leafy towards the summit, tubercled towards the base. *Leaves* alternate, beautifully variegated with green and golden yellow, generally retuse. *Flowers* at the summit of the branches in slender racemes, peduncled, smooth, as long or longer than the leaves; bractes one to each flower, oval; calyx of the female about half the length of the germ. A native of the Moluccas and Japan, and of Malicollo and Tanna in the South Seas. It is cultivated for the beauty of its foliage in many parts of the East Indies, and is employed as an ornament both in times of festivity, and at the funerals of unmarried persons. 2. *C. cascarilla*. Linn. Sp. Pl. 4. Lam. 2. Willd. 2. (*C. lineare*; Mart. 2. Ricinoides *æliagni folio*; Plum. Sp. 20. Burm. amer. tab. 240. fig. 1. Catesb. Car. 2. 46. tab. 46. Tourn. 656.) "Leaves lanceolate, quite entire, petioled, flat and scaly above, shining and whitish underneath." Lam. A shrub from three to six or seven feet high. *Stem* short, thick; branches numerous, cylindrical, easily broken, leafy, covered with a smooth, greyish white bark. *Leaves* alternate, resembling those of the almond, not channelled, as in the next species; having their upper surface fludded with orbicular whitish scales, marked with a spot in the middle, as in hippophæ rhamnoides. *Flowers* small, in terminal spikes; males uppermost, with a five-leaved calyx and five whitish petals; females lower, with a very small five-cleft calyx, and without petals. The leaves, the young shoots, and especially the bark, have a pleasant aromatic odour when bruised or burnt. Lam. A native of Carolina and South America. The bark of this plant has been generally supposed to be the cascarilla of the shops. See CASCARILLA. Dr. Woodville, in the earlier part of his medical botany, expressed his doubts on the subject; and in his appendix to that work, declared himself fully convinced that the cascarilla is obtained solely from the cluytia cleuteria of Linnæus, which Swartz and Willdenow have removed to the present genus. See CLUYTIA *Eleuteria*. 3. *C. lineare*. Lam. 3. Hort. Kew. p. 374. Jacq. Am. 256. tab. 162. fig. 4. (*C. cascarilla*; Woody. Med. Bot. 41. *C. cascarilla* β . Willd. Ricinoides *resinarii folio*; Sloan, Jam. lut. 133. tab. 86. fig. 1.) "Leaves linear, on very short petioles, with two glands at the base, channelled and green above, tomentous-white underneath." La Marck was satisfied by well preserved specimens in the herbarium of Jussieu, that this plant is specifically distinct from the preceding,

ceding, though they have been confounded by Linnæus. The author of Hortus Kewensis appears to have been of the same opinion by his excluding the synonyms of Catesby and Plumier, quoted under *C. cascarilla*. A shrub, four or five feet high, erect, much branched; branches cylindrical, yellowish, somewhat tomentous. *Leaves* about an inch and half long, a line and half or two lines broad, exactly linear, retuse; clothed underneath with a dull white or yellowish down, which, when viewed through a lens, is found to consist of stellated hairs, a character which belongs to most of the hairy species of this genus; glands opposite, cylindrical, truncated, horizontal. *Flowers* in spikes. The whole plant has a pleasant smell. A native of the West Indies. In Jamaica it is called wild rosemary. The plant cultivated by Miller under the name of *C. cascarilla*, appears to have been the present species. 4. *C. cochinchinense*. Mart. 39. (*C. punctatum*; Lour. Cochinch. 581.) "Leaves alternate, lanceolate, quite entire, hoary underneath, shining, dotted; capsules scurfy." A middle sized tree with spreading branches. *Leaves* smooth, scentless. *Flowers* white; in simple oblong, terminal racemes; males on the upper part; calyx bell-shaped, with five divisions; petals five, lanceolate-egg-shaped, spreading; filaments fourteen, longer than the corolla; females below; calyx and petals as in the male; germ trigonous; styles three, short; stigmas quadrifid, filiform, inflexed. A native of woods in Cochinchina. 5. *C. compressum*. Lam. 20. Willd. 62. "Leaves alternate, entire, tomentous underneath; petioles somewhat decurrent; little branches compressed." *Branches* hard, somewhat woody, angular, a little pubescent or mealy towards the top. *Leaves* resembling those of *Solanum laurifolium*, petioled, almost smooth, and sprinkled with scarcely perceptible dots above, tomentous and greyish white underneath. *Flowers* in spikes at the extremity and forks of the branches. Found by Commerçon in Brazil. 6. *C. dioicum*. Mart. 42. Willd. 7. Cav. ic. 1. 4. tab. 6. "Leaves scattered, lanceolate, narrowed at the base, obtuse, quite entire, tomentous, nearly sessile; flowers dioicous." Whole plant covered with a soft nap. *Stem* cylindrical, with divaricating branches. *Leaves* silvery underneath, somewhat channelled, spreading. *Male flowers* in terminal spikes, pedicelled, with awl-shaped bractes; calyx bell shaped, half-five-cleft; corolla none; nectariferous glands five, yellow, placed in a ring at the bottom of the calyx; filaments twelve or thirteen, not united at the bottom, a little longer than the calyx and attached to it in its lower part, villous, green. *Female flowers* like the male in the calyx and glands, but on a different plant, and on three flowered terminal peduncles; germ roundish; styles three, united at the base, half-five-cleft. *Capsule* larger than a pea. *Seeds* egg-shaped, smooth. A native of Mexico, cultivated at Madrid. 7. *C. polygamum*. Mart. 51. Jacq. Amer. pict. tab. 263. fig. 59. "Leaves alternate, lanceolate, ferrated, thinly set with decumbent hairs." An upright shrub, four feet high, but little subdivided. *Branches* cylindrical, smooth, cinereous. *Leaves* almost three inches long, on very short petioles, acute, smoothish, green on both sides. *Flowers* usually appearing before the leaves, whitish, scentless, some hermaphrodite, others male and others female on the same, or on different plants; hermaphrodites, calyx five-leaved; petals oblong, longer than the calyx; germ three-grooved; style femitrid with bifid segments. A native of Carthage, in New Spain. 8. *C. dichotomum*. Willd. 19. "Leaves lanceolate, ferrated, hairy, tomentous underneath; spikes from the forks of the branches; branches dichotomous, divaricated." *Branches* thick, woody, greyish brown. *Leaves* half an inch long, on short petioles. *Spikes* half an inch

long. A native of St. Domingo. 9. *C. discolor*. Willd. 3. "Leaves elliptical, quite entire, obtuse, mucronat, petioled, densely tomentous underneath; flowers dioicous." Nearly allied to *C. cascarilla*; n. 2. A native of the Island of St. Croix in the East Indies. 10. *C. maritimum*. Willd. 4. Walt. Car. 239. (*C. disjunctiflorum*; Mich. amer. bor. 2. 214.?) "Leaves elliptical, quite entire, rather obtuse, hoary, tomentous underneath, spikes terminal, few-flowered." *Leaves* half an inch long, wrinkled on the upper surface; petioles long, tomentous. *Female flower* solitary at the base of the spike. 11. *C. lanatum*. Lam. 29. Willd. 65. "Leaves elliptical, quite entire, woolly on both sides; racemes terminal and from the forks of the branches; stamens bearded." Whole plant covered with a short, woolly, brownish down, giving it a sombre appearance. A low shrub, with loosely spreading branches. *Leaves* alternate, often opposite at the tops and under the forks of the branches, small, on short petioles. *Flowers* yellowish; males with at least ten stamens; females with three short, villous styles. A native of South America, near Monte Video. 12. *C. levigatum*. Mart. 46. Willd. 39. "Leaves elliptical, smooth and even on both sides, with one gland at the base, quite entire, or ferrated, obtuse; racemes terminal, elongated." *Branches* cylindrical, proliferous, pulverulent-scaly and cinereous near the top. *Leaves* petioled, clustered at the ends of the branches, two inches long or more, paler underneath, membranous, either quite entire, or slightly and obtusely ferrated near the top; stipules awl-shaped, deciduous. *Common peduncle* about seven inches long, erect, striated-angular, covered with farinaceous scales, mucicated after the fall of the flowers; calyx somewhat hirsute; stamens numerous. A native of Hainam. 13. *C. reticulatum*. Willd. 41. "Leaves oblong, acuminate, quite entire, smooth on both sides, reticulated underneath; raceme terminal, elongated." *Branches* cylindrical, dark brown; younger ones pubescent. *Leaves* three or four inches long; petioles pubescent. *Raceme* half a foot long. 14. *C. laurinum*. Mart. 35. Willd. 37. "Leaves oblong, acute, quite entire, somewhat thick and rigid, smooth, dotted underneath; petioles scabrous, dotted; racemes axillary, very long, spreading; stem arboreous." A native of Jamaica. 15. *C. ovalifolium*. Willd. 8. Welt. Sr. Cruc. 253. "Leaves oblong, obtuse, attenuated at the base, finely ferrated at the tip, petioled, smooth; little branches hairy." *Leaves* an inch long, green on both sides, thinly set with stellated hairs; petioles long. *Flowers* in a terminal spike; females three or four at the base, on long peduncles. A native of the islands of St. Cruz and St. Thomas. 16. *C. argyranthemum*. Willd. 12. Mich. amer. bor. 2. 215. (*C. punctatum*; Jacq. ic. rar. 3 tab. 161.) "Leaves oblong, quite entire, tomentous underneath, petioled; peduncles terminal, about two-flowered." *Calyxes* pedicelled, silvery white. A native of dry woods in Georgia and Florida. 17. *C. divaricatum*. Mart. 33. Willd. 28. Swartz. prod. 100. Flor. ind. sec. 2. 1187. "Leaves oblong, obtuse, ferrated, rough with hairs, with two glands at the base; racemes terminal, solitary; branches dichotomous, divaricated." A native of dry thickets in the West Indies. 18. *C. procumbens*. Mart. 49. Jac. amer. "Leaves wedge-shaped, acute, quite entire." A shrub, three feet high, smooth, scentless. *Stems* partly erect, partly procumbent. *Leaves* two inches long, alternate, petioled. *Flowers* small, green; peduncles axillary, very short, usually with four males at the top and two females below, petals of the females twice the length of the calyx. Common at Carthage in South America. 19. *C. citrifolium*. Lam. 26. Willd. 15. (*Ricinoides arbor, folio citri*; Plum. Sp. 20. Burm.

C R O T O N.

Burm. Amer. tab. 240. fig. 2. Tourn. 656.) "Leaves ovate-lanceolate, entire, covered with a shining meal; spikes axillary; capsules round, rough with warts, silvery." A tree about the size of an apple-tree, with a dark red bark. *Leaves* very numerous, alternate, petioled, in size and nearly in shape resembling those of the citron, but less firm. *Flowers* in spikes near a foot long: males at the top; calyx with five divisions: petals five, white, oval; stamens numerous; females below; calyx with five divisions, powdery. *Capsule* round, a little less than a hazel nut, covered with a silvery meal. *Seeds* oblong, convex on one side, angular on the other. Observed by Plumier in the island of St. Domingo. 20. *C. balsamiferum*. Linn. Mant. 125. Mart. 15. Lam. 4. Willd. 50. Jacq. Amer. 255. tab. 162. fig. 3. pict. 124. tab. 242. Hort. 3. tab. 46. "Leaves ovate-lanceolate, quite entire, with two glands at the base, scabrous, tomentous underneath; capsules tomentous." A shrub, three or four feet high, sweet-scented, erect, branched, diffuse, covered all over with a close yellowish down. *Leaves* scatteringly alternate, from two to three inches long, acute, on rather long petioles. *Flowers* small, in spikes both terminal and proceeding from the divisions of the upper branches; males uppermost, with a five-parted calyx and five white petals. It much resembles *C. humile*, (n. 59.) but its leaves are not heart-shaped. A native of the West Indies. The whole plant abounds with a thickish, yellowish, sweet-scented balsamic juice, which drops from it when it is cut or broken. In Martinico this juice is distilled with spirits of wine, and a cordial liquor obtained, which is introduced at the table and called Eau de Mante. 21. *C. erioanthemum*. (*C. lanatum*; Mart. 40. Lour. Cochinch. 581. "Leaves opposite, ovate-lanceolate, quite entire, smooth; corollas woolly." A large tree with spreading branches. *Flowers* white, in simple terminal racemes; males at the top; calyx tubular, five-parted, erect; petals five, egg-shaped, woolly within, the length of the calyx; filaments fifteen, the length of the corolla; females below; calyx permanent, five-leaved; the leaves spreading, egg-shaped, acute; corolla none; germ egg-shaped; style none; stigmas three, filiform, short, bifid, reflexed. *Capsule* egg-shaped, tubercled at the top. A native of woods in Cochinchina. La Marck having called another plant lanatum, (see n. 11.) we have been under a necessity of giving a new name to the present. 22. *C. farinosum*. Lam. 28. Willd. 61. "Leaves opposite, ovate-lanceolate, nearly entire, green above, covered with a hoary mealiness underneath; spikes slender." A beautiful shrub, remarkable for the strong contrast of colour in the upper and under sides of the leaves. *Branches* cylindrical, slender, smooth, greyish, loose, several times dichotomous. *Leaves* two inches long, in shape resembling those of common sage, on short petioles. *Spikes* two or three inches long, some terminal, others in the forks of the upper branches; female flowers at the base of the spike, white, mealy, with five acute divisions; germ roundish; styles three, quadrifid, widely expanding. Found by Commerçon in the island of Madagascar. 23. *C. umbellatum*. Willd. 42. "Leaves ovate-oblong, acuminate, quite entire, smooth on both sides; flowers in terminal umbels." Whole plant quite smooth. *Branches* cylindrical, cinereous-brown. *Leaves* three or four inches long, simply veined. *Umbel* simple, about six-flowered, on a capillary peduncle. A native of the East Indies. 24. *C. sericeum*. Lam. 25. Willd. 48. (*C. matourense*; Aubl. guian. 879. tab. 338.) "Leaves ovate-oblong, acuminate, silky-hoary underneath with two glands at the base; female calyxes ciliated." A tree. *Trunk* from eight to ten feet high, about nine inches in diameter, with an even cinereous bark; branches tender.

Leaves alternate, entire, on rather long petioles. *Flowers* in a long, loose, villous, cinereous spike; calyx of the males with five deep, acute divisions; petals five, lanceolate, cinereous; filaments eleven, villous at the base; calyx of the females with five oval, fringed leaves; styles from twelve to sixteen, curved inwards; bractes two, small, scale-like at the base of each pedicel. A native of Cayenne and Guiana. 25. *C. subulatum*. Lam. 27. Willd. 25. (*C. guianense*; Aubl. guian. 882. tab. 339.) "Leaves oblong-ovate, acuminate, serrated, with two glands at the base, ferruginous-tomentous underneath; capsules smooth." A smaller tree than the preceding, with a trunk not more than six inches in diameter. *Leaves* on long petioles. *Flowers* whitish, small, in axillary spikes near the ends of the branches. A native of Guiana. 26. *C. montanum*. Willd. 46. "Leaves ovate-oblong, acuminate, quite entire, with two glands at the base, tomentous and resinous dotted underneath." *Branches* cylindrical, pubescent. *Leaves* four or five inches long, petioled, a little narrowed at the base, somewhat scabrous on the upper surface, hoary and sprinkled with very minute scarlet, resinous dots underneath. *Racemes* axillary and terminal, two inches long. The hairs in this species are not stellated. Found by Klein on mount Kalisghar, near Velur in the East Indies. 27. *C. coccineum*. Mart. 45. Willd. 38. Vahl. symb. 2. 97. "Leaves somewhat egg-shaped, acuminate, quite entire, smooth on both sides, with two dark brown glands at the base, dotted with scarlet underneath; racemes terminal." *Branches* cylindrical, pulverulent-villous near the summit. *Leaves* two or three inches long, petioled, attenuated in the upper part, rather acute at the base, three-nerved, reticularly veined underneath and a little coloured by numerous, very minute, pellucid, scarlet dots; petioles an inch and half long, cylindrical. *Flowers* nearly sessile; racemes two inches long, either terminal and solitary, or crowded in the upper axils; peduncle yellow-ferruginous, angular; styles reflexed; germ white, dotted with scarlet. *Capsules* oblong, scarlet. Vahl. 28. *C. inophyllum*. Mart. 27. Willd. 14. Forst. prod. 355. "Leaves inversely egg-shaped, quite entire; stem arboreous." A native of New Caledonia. 29. *C. abnifolium*. Lam. 9. Willd. 13. "Leaves inversely egg-shaped, petioled, nearly entire, dotted with scattered stellated hairs; racemes elongated, nearly terminal." *Branches* dotted, tomentous towards the summit. *Leaves* alternate, more hairy underneath; young ones tomentous, whitish. *Flowers* in slender, loose racemes; peduncles and calyxes somewhat tomentous; filaments of the males ten, villous or bearded. *Capsules* almost sessile, roundish-oval, covered with small stellated hairs, which fall off here and there, and leave those parts smooth. When the capsules fall off, the receptacles of the seeds remain on the common peduncle with three teeth at their summit, which have the appearance of permanent pedicels. Specimens brought by Dombey from Peru. 30. *C. betulinum*. Mart. 47. Willd. 18. Vahl. symb. 2. 98. "Leaves egg-shaped, obtuse, unequally toothed, scabrous-dotted above, pubescent underneath; racemes axillary, longer than the leaf." The habit of a birch. *Branches* cylindrical, purplish; younger ones hoary, covered with scales and striated hairs. *Leaves* an inch long, with a minute pedicelled gland at each side of the base; petiole shorter than the leaf. *Flowers* small, a little remote, rough with hairs; calyx of the females with five linear, obtuse leaves. A native of the isles of St. Thomas and Domingo. 31. *C. glabellum*. Linn. Sp. Pl. 5. Mart. 5. Lam. 23. Willd. 16. (*C. fruticosum*, foliis subrotundo-ovatis, lpiculis axillaribus; Brown. Jam. 348. Mali folio arbor; Sloan. Jam. 59. Hist. 2. 30. tab. 174. figs.

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figs. 3, 4.) "Leaves egg-shaped, rather obtuse, quite entire, even-surfaced; fruit peduncled." Seldom less than seven or eight feet high. *Leaves* alternate, petioled, glaucous underneath. *Fruit* smooth. According to Browne, all the parts of the plant are of an active warm nature, and have an agreeable smell. La Marck observes that Sloane's figures belong to trees from twenty to thirty feet high; and that in one of them the flowers are in simple terminal spikes, but in the other form lateral axillary panicles. A native of Jamaica. 32. *C. globosum*. Mart. 32. Swartz. prod. 100. "Leaves egg-shaped, obtuse, entire; peduncles in pairs; flowers dioecious; fruit globular, echinate-hispid." A native of Jamaica. 33. *C. punctatum*. Mart. 25. Willd. 45. Retz. Obs. 5. 30. "Leaves egg-shaped, acute, quite entire, tomentous underneath, dotted." *Flowers* in a spike. *Capsules* silky-hairy, scarlet. Sent from Ceylon by Koenig. 34. *C. fissiflorum*. Mart. 31. Swartz. prod. 100. "Leaves egg-shaped, acuminate, quite entire, smooth; flowers sessile, axillary, dioecious, with five stamens." A native of Hispaniola. 35. *C. organifolium*. Lam. 6. (Ricino affinis odorifera, teucriti folio; Sloan. Jam. Hist. t. 133. tab. 86. fig. 3.) "Leaves egg-shaped, acute, nearly entire, with two setaceous glands at the base, tomentous-hoary underneath." Resembling *C. lineare* (n. 3.) in the texture and colour of the leaves, but differing in their form. *Branches* very slender, cylindrical, diffuse, divided, villous only at the summit. *Leaves* alternate, small, entire or very finely toothed, with a longitudinal furrow above, nerved underneath, on rather long peduncles. A native of St. Domingo. 36. *C. philippense*. Lam. 14. "Leaves egg-shaped, somewhat acuminate, nearly entire, with two glands at the base, tomentous and reticulated underneath; capsules covered with a scarlet wool." *Branches* cylindrical, slightly tomentous at the summit. *Leaves* alternate, petioled, even and smooth above, nerved. *Flowers* in terminal racemes not longer than the leaves. A native of the Philippine islands; found by Sonnerat. 37. *C. lacciferum*. Linn. Sp. Pl. 12. Mart. 14. Lam. 13. Gert. tab. 107. (Aleurites laccifera; Willd. Ricinoides, circeæ folio; Burm. Zeyl. 201. tab. 91. Pluk. alm. 520.) "Leaves egg-shaped, somewhat acuminate, toothed, on long petioles; calyxes tomentous." A middle-sized tree. *Branches* few, long, spreading, angular, rugged. *Leaves* scattered. *Flowers* in simple terminal racemes, white, with five-leaved calyxes; males uppermost; corolla five-petaled; stamens from fifteen to twenty. *Capsules* small, globular, not grooved, enclosed at the base by the permanent spreading calyx. A native of Ceylon, Cochin-China, and Cambodia. A very fine lac exudes spontaneously from the tree, appearing like a small pearl or bud within the axils of its branches. It is used by the inhabitants of Ceylon to varnish their lances, the handles of their knives, &c. 38. *C. lignum*. Linn. Sp. Pl. 10. Mart. 12. Lam. 21. Willd. 6. Gert. tab. 107. (Pinus indica; Bauh. Pin. 492 n. 11. Lignum moluccense; Bauh. Pin. 393. n. 12. Ricinoides indica; Burm. Zeyl. 200. tab. 90. Granum moluccarum; Rumph. Arb. 4. 98. tab. 42. Cadi-avenien; Reed. Mal. 2. 61. tab. 33. Rai. Hist. 167. 1803. 1830. 1855. Supp. 112. (66.)) "Leaves egg-shaped, acuminate, ferrated, smooth, with two glands at the base; petioles shorter than the leaves; racemes terminal." A middle-sized tree. *Trunk* rather slender; branches few, smooth, spreading, leafy on their upper part. *Leaves* alternate-nerved; young ones studded with stellated hairs, which give them a dotted appearance. *Flowers* whitish, or inclining to yellow; males uppermost; calyx five-parted; petals five; stamens about sixteen; females below; calyx small, five-

leaved, stellated, reflexed under the capsule. *Capsules* almost the size of a hazel-nut, smooth, three-furrowed. *Seeds* oval-oblong, a little shining, convex on one side, very obtusely-angular on the other. A native of the East Indies, where it is cultivated for the sake of its medicinal, and particularly of its purgative qualities. Both its wood and its seeds are in use; but on account of their very violent acrid nature, they are little esteemed in Europe, and have not been admitted into the dispensaries either of London or Edinburgh. 39. *C. congestum*. Mart. 41. Lour. Coch. 582. "Leaves egg-shaped, serrated, smooth, veined, flowers cinnabarred, naked, axillary." *Stem* somewhat shrubby, five feet high, with many reclining branches. *Leaves* alternate, unequal. *Flowers* both male and female without petals; stamens eighteen. *Capsules* pendulous. A native of China, about Canton. 40. *C. dentatum*. (C. populifolium; Willd. 35. Mart. 38. Swartz. Prod. 101. Flor. Ind. Occ. 1197. Vahl. Symb. 2. 97.) "Leaves broad-egg-shaped, acuminate, ferrate-toothed, with two glands at the base (one, Vahl.); petioles the length of the leaves; racemes terminal, erect, solitary." *Branches* smooth, scarred. *Leaves* near together towards the top of the branches, with stellated fulvous hairs on both sides. *Calyx* of the male flowers smooth, coloured; of the females, with lanceolate, hairy, tooth-gashed leaves, and glandular teeth; germ rough with hairs. A native of Jamaica, and other parts of the West Indies. As both Miller and La Marck have a different populifolium (see n. 64, 65.) we have given a new trivial name to the plant before us. 41. *C. acuminatum*. Lam. 17. "Leaves egg-shaped, acuminate, some entire, others thin and slightly toothed, without glands, tomentous underneath; spikes axillary and terminal, tomentous-ferruginous." *Branches* somewhat tomentous, compressed towards the summit. *Leaves* large, obliquely nerved, reticularly veined; upper ones often opposite; petioles, peduncles, and calyxes ferruginous-tomentous. *Spikes* generally simple; filaments thirty or more, not united at the base. Found by Commerçon at Port Praslin in New Britain. It resembles *C. japonicum* (n. 55.), but differs in being shrubby, or perhaps a tree, and in having leaves not entirely smooth. 42. *C. rhombifolium*. Willd. 70. "Leaves rhomboid-egg-shaped, acuminate, sometimes repand, smooth on both sides, sprinkled with pellucid dots; racemes paniced, pubescent." *Leaves* some repand, others quite entire; younger ones covered with a slight pubescence. A native of the island of Ceylon. Distinguished from the preceding by the shape and smoothness of its leaves, and from *C. japonicum*, by having none of its leaves slightly three-lobed, as well as by its shrubby stem. 43. *C. paniculatum*. Lam. 16. Willd. 29. "Leaves egg-shaped, somewhat rhomboidal, mucronate, entire or slightly toothed, with two glands at the base, tomentous underneath; panicle ferruginous-tomentous." *Leaves* a little resembling those of black poplar, dark-green, and smooth above, whitish, inclining to ferruginous underneath. *Flowers* very numerous, small, sessile, in a rather large, branched panicle. Found by Commerçon and Sonnerat in the island of Java. 44. *C. jessoferum*. Tallow-tree. Linn. Sp. Pl. 9. Mart. 9. Lam. 22. (Stillingia sebifera; Willd. Ricinus chirensis sebifera; Per. Gaz. 53. tab. 54. fig. 3. Evonymo affinis; Pluk. Amath. 76. tab. 390. fig. 2.) "Leaves rhomboid egg-shaped, acuminate, quite entire, smooth, with two very small glands at the base." A tree about the height of a pear tree, and in habit resembling a cherry tree, with a light-grey, soft bark; branches long, flexible, smooth, leafy from the middle. *Leaves* scattered, numerous, becoming smaller, and forming tufts at the extremity of the branches, broader than long, resembling those of the black

poplar,

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poplar, but not toothed, green and smooth on both sides, deciduous, turning red before they fall; stipules two at the base of the young leaves, membranous, linear-lanceolate. *Flowers* in spikes two inches long, and resembling catkins; males numerous, very small, pedicelled; calyx very short, one-leaved, almost truncated, or very little divided; stamens from three to five, but little longer than the calyx; females few, at the base of the spikes. *Capsules* oval, pointed, with three convex sides, smooth, hard. *Seeds* almost hemispherical, convex on one side, flattened and furrowed on the other, covered with a delicate snow-white substance. These seeds are attached by their upper interior part to three thread-like receptacles, and remain after the six valves of the capsule have fallen off, so that the spike then seems composed of small racemes with very white berries. A native of China, on the banks of rivulets. The Chinese obtain a kind of tallow from the seeds after they have been well cleared of the white substance in which they are enclosed, which would otherwise considerably lessen the quantity of oil. For this purpose they are steeped ten or fifteen days in water, after which this covering may be completely rubbed off, though not without some difficulty. The oil drops from the seeds like thick glutinous lamp oil, and soon hardens to the consistency of common tallow. This tallow is also obtained by boiling the seed, and skimming off the oil as it rises. Candles made of it are very white, but are sometimes coloured by adding to it a little vermilion; these candles, says sir George Staunton, are firmer than those of tallow, as well as free from all offensive odour; but they are not equal to those of wax or spermaceti. 45. *C. nutans*. Mart. 26. Willd. 34. Vahl. Symb. 2. 96. Forst. Prod. 354. "Leaves rhomboidal-egg-shaped, acuminate, undulated, smooth; glands marginal." Similar to the preceding; but its leaves are less acuminate, and the glands are not on the petiole at the insertion of the leaf, but on the margin of the leaf itself, a little above its base. *Spikes* two or three inches long. *Flowers* in two rows. A native of the Society and Friendly isles, and of the New Hebrides. 46. *C. bracteatum*. Lam. 18. Willd. 33. "Leaves opposite, especially the upper ones, acute, entire, with two glands at the base, tomentous underneath; racemes long, loose, bracteate." *Branches* cylindrical, several times dichotomous, cinereous, tomentous, a little ferruginous near the summit. *Leaves* petioled. Petioles, peduncles, calyxes, and germs tomentous and villous. *Raceme* from four to six inches long, simple, proceeding from the forks of the upper branches; bractes oblong-lanceolate, sessile, caducous. *Flowers* pedicelled, from two to five together in lateral bundles; females large; calyx with five oval-oblong leaves; germ large, trigonous; styles three, multifid, pencil-shaped. Found by Commerçon in the island of Madagascar. 47. *C. lucidum*. Linn. Sp. Pl. 11. Mart. 13. Lam. 24. Willd. 44. Swartz. Flor. Ind. Occ. 2. 1193. (*C. pallens*; Linn. Mant. 497. Mart. 36. Swartz. Prod. 100. *C. spicatum*; Berg. Trans. Roy. Soc. 1768. p. 132. tab. 7. *C. erectum*, glabrum; Brown. Jam. 347. n. 6.) "Leaves opposite, egg-shaped, acuminate, nearly entire, smooth on both sides; racemes erect, terminal; calyxes larger than the fruit." Calyx of the males ten-leaved, imbricated, hirsute on the inner side; corolla none; that of the females five-leaved; germ hirsute. A native of Jamaica. 48. *C. eriospermum*. Lam. 30. "Leaves opposite, egg-shaped, acuminate, quite entire; racemes compound; seeds involved in a reddish wool." *Branches* slender, cylindrical, smooth, leafy. *Leaves* green and smooth above, greenish underneath, with a fine down, chiefly on the edges. *Flowers* in axillary and terminal racemes. *Capsules* oval, dotted. *Seeds* several in each cell. Found by Commerçon in Brazil, near Rio-Ja-

neiro. La Marck's specimens were without flowers, and he very justly observes, that the polyspermous cells of the capsule render its true genus dubious. 49. *C. castuoides*. Lam. 31. "Leaves opposite, egg-shaped, toothed, smooth on both sides; petioles scabrous, channelled; spikes few-flowered." A small shrub. *Branches* very slender, slightly ferruginous-tomentous near the top. *Leaves* lessened at both ends. *Flowers* in short, ferruginous, terminal spikes; calyx and germ with short, stellated hairs; styles three, trifid or quadrifid. Found by Commerçon in the island of Madagascar. 50. *C. flavens*. Linn. Sp. Pl. 13. Mart. 20. Lam. 32. Willd. 63. (*C. frutescens* & villosum; Brown. Jam. 347. n. 3.) "Leaves heart-shaped, oblong, acuminate, quite entire, hoary above, tomentous underneath, with two pedicelled glands at the base; little branches densely tomentous." A shrub, two or three feet high. Petioles shorter than the leaves. Spikes from the forks of the branches. A native of Jamaica. 51. *C. Richardi*. Willd. 64. "Leaves very slightly heart-shaped, oblong lanceolate, mucronate, quite entire, scabrous, tomentous underneath, with two glands at the base." *Leaves* an inch and half or two inches long, obtuse, with a joint. Little branches and petioles with a yellowish down. *Raceme* two inches long, peduncled, terminal, and from the forks of the branches. 52. *C. Afroites*. Mart. 24. Willd. 66. Hort. Kew. 3. p. 375. "Leaves oblong-lanceolate, somewhat heart-shaped, scabrous, tomentous underneath, with two glands at the base; little branches more densely tomentous." Willd. "Leaves oval, somewhat heart-shaped, quite entire, stellate-tomentous on both sides. Little branches more densely tomentous." Hort. Kew. *Leaves* two inches long and more, green above, and covered with numerous elevated dots, and scattered stellated hairs, with two pedicelled glands at the base, the pedicels tomentous. *Raceme* terminal, and in the forks of the branches. Willd. A native of the West Indies. The last three species are nearly allied. 53. *C. leprosum*. Willd. 65. "Leaves cordate, lanceolate, quite entire, tomentous underneath; little branches more densely tomentous; spikes axillary." *Leaves* three inches long, green above, and set with numerous stellated hairs, densely tomentous, and white underneath. *Spikes* on long peduncles. No glands at the base of the leaves. A native of St. Domingo. 54. *C. mucronatum*. Willd. 32. "Leaves heart-shaped, roundish, elliptical, obtuse, mucronate, quite entire, tomentous on both sides." *Branches* and petioles ferruginous-tomentous. *Leaves* resembling those of mespilus cotoneaster, almost an inch long, thick, on long petioles. *Spikes* an inch, or an inch and half long, axillary, and terminal. A native of the warmer parts of America. 55. *C. albaefolium*. Mart. 29. (Ricnoides, althææ folio; Plum. Cat. 20.) "Leaves oblong-heart-shaped, tomentous; stem branched; spikes terminal." A shrub, six or seven feet high; branches covered with a yellowish down. *Leaves* two inches and a half long, one inch broad, on long petioles, acute, curved on both sides, with down like that on the branches. *Flowers* in long, loose spikes; males uppermost; corollas white, deeply five-cleft; stamens five, taper; females below; calyxes large, woolly. *Capsules* round. Sent to Miller from Jamaica by Dr. Houlston. 56. *C. arenaticum*. Linn. Sp. Pl. 14. Mart. 16. Willd. 55. Vahl. Symb. 2. 98. Gært. tab. 107. (*C. tiliaefolium*, β . Lam. Ricnoides, circææ foliis, media; Burm. Zeyl. 202. 11.) "Leaves heart-shaped, scabrous, somewhat serrated, petioled; stem arboreous." Linn. "Leaves cordate egg-shaped, serrated, scabrous, with petioled glands underneath at the base, and on the edges; racemes terminal." Vahl. "Leaves oblong, somewhat heart-shaped, finely serrated, scabrous,

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scabrous, pubescent underneath, with two glands at the base; lowest ferratures with pedicelled glands; raceme terminal." Willd. A middle-sized tree. Branches spreading, subdivided, cylindrical, rugged, marked with interspersed minute and larger dots, tomentous towards the end, with stellated hairs. *Leaves* large, spreading, unequally serrated; younger ones acuminate, somewhat tomentous, with stellated hairs, especially underneath; older ones obtuse, almost naked, only a little hairy on the veins, paler, dotted and rugged underneath; petioles one-third of the length of the leaf, tomentous; stipules bristle-shaped, deciduous. *Racemes* two inches long, quite simple, rather erect; bracte bristle-shaped at the base of each pedicel. *Flowers* numerous, scattered, villous; males uppermost; leaves of the calyx numerous, egg-shaped; stamens villous at the base. Linn. and Vahl. Calyx of the females short, five-leaved, reflexed under the capsule. *Capsule* egg-shaped or globular, smooth, coriaceous, thick, brown, marked with six paler lines. *Seeds* ovate-oblong, convex on one side, angular on the other, rough on all sides, with obscure tubercles. Gært. A native of the island of Ceylon. Gærtner asserts that *halæcus littorea* of Linnæus is erroneously quoted by Linnæus as a synonym. It appears to have been solely on account of this synonym that La Marck was induced to make this species a variety of his *tilæfolium*, though he acknowledges that his plant does not in all respects correspond with Rumphius's description, and seems almost equally inclined to consider his mauritanium as the true aromaticum of Linnaeus. It is certainly very nearly allied, but we think not the same; we shall therefore keep them distinct, and leave it to future observers to determine their identity or difference. 57. *C. mauritanium*. Lam. 12. (*Halecus terrestris* aibus; Rumph. Amb. 3. 198. tab. 1. 7. A.) "Leaves cordate-oblong, acute, finely serrated, slightly scabrous; peduncles and petioles woolly; racemes terminal." A tree; young branches woolly, whitish. *Leaves* for the most part alternate, acute, green, and almost smooth above, but a little rough, with small woolly dots; slightly woolly and cinereous underneath. *Flowers* white, in woolly terminal racemes; males uppermost; calyx tomentous, one-leaved, with five divisions; petals five, white, woolly; stamens from thirty to fifty, short; females pedicelled; calyx and corolla as in the males; germ tomentous; styles at least twelve, short, villous. *Capsules* tomentous. *Seeds* egg-shaped, shining, with a somewhat triangular umbilicus. Found by Commerçon in the Ile of Bourbon. 58. *C. scabrum*. Willd. 56. "Leaves oblong-egg-shaped, cordate, acuminate, quite entire, scabrous above, hoary-pubescent underneath; racemes terminal." A shrub, eight feet high; branches cylindrical, hoary. *Leaves* three inches long and more; petioles hoary. *Racemes* an inch and half long, similar to the next species, but the leaves are much larger, somewhat different in form, are scabrous above, with dots only, not with stellated hairs, and are pubescent underneath, but not tomentous. A native of dry rocky ground about Caraccas. 59. *C. lumil.* Linn. Sp. Pl. 16. Mart. 17. Willd. 57. (*C. sidsifonium*; Lam.? *Croton fruticosum minus*; Brown. Jan. 5. 6.) "Leaves heart-shaped, quite entire, somewhat crenated, scabrous, tomentous underneath." Linn. "Leaves somewhat cordate-egg-shaped, acute, quite entire, scabrous above, tomentous underneath." Willd. "Leaves cordate-oval, entire, scabrous, hoary, tomentous underneath; racemes small, terminal." Lam. A shrub two feet high, with a smooth branching stem; branches hoary at the end. *Leaves* alternate, ruvous, clammy, scabrous, with warts which are terminated by minute white hairs, contiguous at the base; petioles somewhat hairy. *Flowers*

in terminal, erect spikes; males uppermost, from five to seven, smaller, whitish; calyx with five hoary leaves (with five divisions; Lam.); petals five, white, equal to the calyx (smooth and coloured without, villous at the edges and within; Lam.) filaments from twenty to twenty-four (at least six; Lam.) anthers compressed, whitish; females below, larger, greenish; calyx five leaved (tomentous, with five acute deep divisions; Lam.) corolla none; germ three-grooved, hirsute (slightly tomentous; Lam.) styles three, white, contiguous at the base, four-parted to the middle (bifid or trifid; Lam.) stigmas first white, then rufescent. *Capsule* somewhat hirsute. *Seeds* roundish. The smell of the whole herb is strong and balsamic. Swartz. A native of Jamaica. La Marck's plant was from St. Domingo, and does not appear to be materially different from that of Linnaeus. 60. *C. niveum*. Mart. 50. Jacq. Amer. pict. tab. 243. Lam. 10? "Leaves heart-shaped, acuminate, finely serrated, tomentous-shining underneath;" Jacq. "Leaves cordate-oblong, acute, entire, undulated at the edges, tomentous-silvery underneath." Lam. A shrub ten feet high, having in all its parts a pleasant aromatic smell. *Leaves* green above. *Flowers* in close spikes an inch long, coming out before the leaves; males very numerous; females few, either situated below, or intermingled with the males; calyx tomentous, somewhat ferruginous; corolla white; styles three, branched, the length of the germ, reflexed, and embracing it closely. The male flowers are in such vast abundance that when they fall off, they whiten all the ground. In the specimen from which La Marck formed his specific character, and which he believes to be the present plant, the leaves are either entire, or slightly undulated at the edges, not toothed or serrated. A native of the West Indies. 61. *C. salviaefolium*. Mart. 30. Mill. (*Ricinus salviaefolio*; Pet. hort. sic.) "Leaves heart-shaped, acute, tomentous; flowers in terminal and axillary spikes." A shrub near four feet high, with a silvery bark. *Leaves* about three quarters of an inch long, and half as broad at the base, tomentous on both sides, yellowish-green above, silvery underneath. *Flowers* small, white; calyxes woolly. *Capsules* roundish. 62. *C. nitens*. Mart. 34. Willd. 47. Swartz. prod. 100. Flor. ind. occ. 2. 1189. "Leaves somewhat cordate-egg-shaped, acuminate, entire, smooth, shining, silvery-squamous underneath; racemes axillary, erect, shorter than the leaves." *Leaves* covered underneath with minute scales, in each of which there is a pellucid point. A native of Jamaica. 63. *C. nicans*. Willd. 52. Swartz. Flor. ind. occ. 2. 1187. (*Ricinus dulcis populea fronde argentea*; Pluk. alm. tab. 220. fig. 5. Brey. prod. 2.) "Leaves cordate-egg-shaped, attenuated, somewhat tomentous, green and warty-squamous above, silvery shining underneath; racemes terminal, erect." A native of Jamaica. 64. *C. populifolium*. Lam. 7. (*Ricinoides foliis populi hirsuti*; Plum. Sp. 20. MSS. 4. tab. 1. 3. Tourn. 656.) "Leaves heart-shaped, acuminate, serrated, villous tomentous underneath; spike terminal." A middle-sized tree, but little spreading. *Branches* cylindrical, clothed with a short down. *Leaves* alternate petioled, sometimes a little angular, greenish above, whitish underneath. Male flowers uppermost; calyx with five divisions; petals five, white; stamens numerous; females, calyx quinquefid; styles three, bifid. *Seeds* sprinkled with small black dots. Found by Plumier in the island of St. Vincent. 65. *C. Milleri*. (*C. populifolium*; Mill. dict.) "Leaves heart-shaped, acuminate, light green above, woolly underneath; spikes short, lateral." A shrub, seven or eight feet high, covered with an ash-coloured bark, sending out many irregular branches. *Leaves* near four inches long, and two broad in their widest part, on slender petioles.

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Flowers whitish green. Sent from Jamaica to Miller by Robert Millar. 66. *C. quadrifetofum*. Lam. 19. "Leaves slightly heart-shaped, acuminate, finely serrated, rough, tomentous, with four bristles underneath at the base." *Branches* tomentous towards the top, with separate hairs which render them somewhat hispid. *Leaves* petioled, whitish green above and rough, with woolly points, very woolly underneath; with four rather long bristles at the base, each terminated by a truncated concave gland. *Flowers* in nearly terminal, woolly racemes, six inches long or more; calyx of the males tomentous, five-leaved; petals five, tomentous on the outside; filaments more than twenty, bearded at the base, but not at all united. Found by Dombey in Peru. 67. *C. puigens*. Willd. 52. Jacq. ic. var. 3. tab. 622. Collect. 4. p. 27. "Leaves deeply heart-shaped, very acuminate, finely serrated, scabrous above, tomentous underneath, with four glands at the base." Glands pedicelled, two on each side at the base of the leaf. A native of the Caraccas. It differs from the preceding in the form of the leaves, but seems only a variety. 68. *C. penicillatum*. Willd. 53. Ventenat choix 12. tab. 12. (*C. ciliato-glandulosum*; Orteg. dec. 4. 51.) "Leaves heart-shaped, acuminate, quite entire, glandular-ciliated, tomentous underneath, with a pencil-shaped bundle of pedicelled glands at the base, and two others at the base of the petiole." A shrub; little branches hoary-pubescent. *Racemes* two inches long, axillary, near the top of the branches; filaments not united. A native of Cuba. 69. *C. macrophyllum*. Mart. 27. Willd. 54. Swartz. prod. 100. Flor. ind. occ. 2. 1: 96. "Leaves cordate-roundish, acuminate, quite entire, thick, tomentous, nerved underneath." A native of Jamaica. 70. *C. tiliaefolium*. Lam. 11. "Leaves heart-shaped, roundish, scabrous, somewhat serrated, petioled; racemes axillary." A small tree, with a greyish bark. Upper part of the branches, petioles, nerves of the leaves, peduncles and calyxes whitish-tomentous. *Leaves* alternate, scarcely acute, on very short petioles. Found by Commerçon in the Isles of France and Bourbon. 71. *C. corylifolium*. Lam. 8. "Leaves heart-shaped, roundish, acuminate, serrated, dotted, nearly smooth on both sides." Small branches, petioles, peduncles, nerves of the leaves and young leaves somewhat tomentous and whitish. *Leaves* alternate, petioled, sometimes a little angular. *Racemes* four or five inches long, peduncled, solitary, lateral, near the tops of the branches. *Flowers* pedicelled. A native of the Antilles. 72. *C. moluccanum*. Linn. Sp. Pl. 15. Mart. 19. Lam. 15. Willd. 59. (*Nux juglans moluccana bifida*; Burm. zey. 170. Camirium; Rumph. amb. 2. 180. tab. 58. Camirium cordifolium; Gært. tab. 125. fig. 2. Ambinox five bancoulia; Commerf. MSS. Herb. and fig.) Nuts of Bancoul. "Leaves heart shaped, angular, scabrous, tomentous underneath." Linn. "Leaves somewhat heart-shaped, angular, obtuse, repand, scabrous, tomentous underneath." Willd. "Leaves heart-shaped, angular, with two glands at the anterior part of the base; calyxes of the male flowers two-parted." Lam. A thick low tree, branched like the common walnut tree. *Leaves* alternate or scattered, near the ends of the branches, large, with three or five angular lobes, smooth on both sides when completely unfolded, covered with a reddish mealy down when young; sometimes oblong, acute, nearly entire; petioles rather long. *Flowers* in a terminal, much branched panicle; males very numerous, on angular tomentous peduncles, without bractes; calyx tomentous; divided into two oval concave lobes, opposite to each other and almost equal; petals five, oblong, linear, almost twice the length of the calyx; stamens about ten, scarcely longer than the

calyx; females not seen by La Marck. Fruit a nut, broader than long, transversely oval, with a short point at its summit, containing, under a hulk somewhat resembling that of a common walnut, two woody shells (noyaux) about the size of a chestnut, rounded at the base, pointed at the summit, a little compressed laterally, with a cavity on the interior side, whitish, one-celled, enclosing a pleasant tasted kernel or seed. A native of the Moluccas and Ceylon, and according to Commerçon, naturalized in the island of Bourbon. We have confined ourselves to La Marck's description as it is the fullest, and taken from specimens recently obtained from Commerçon. Nothing can be more evident than that it cannot belong to this genus; and it is surprising that La Marck, who is generally ready enough to correct Linnæus, has passed it over with slightly observing that in its fruit it approaches aleurites, a new genus formed for a plant found by Forster in the islands of the South Sea. Jussieu afterwards observed, that it ought to be referred to that genus, which Gærtner has since called camirium, the original name in Rumphius, and of which he has given the following corrected generic character from the MS. notes of Dr. Solander. Male and female flowers separate, on the same plant. *Males*; calyx one-leaved, unequally two, three or four-cleft; one segment larger; corolla with five petals, oblong, narrowed at the base, inserted into the receptacle, longer than the calyx; stamens several, up to sixteen. *Females*; calyx and corolla as in the males; nectaries; five egg-shaped glands within the base of the petals; germ superior. *Drupe* dry, two-celled. *Seeds* solitary, nucamentaceous. The kernels of the present plant yield abundance of oil, which is used in the country for candles and other domestic purposes. 73. *C. gossypifolium*. Mart. 48. Willd. 73. Vahl. symb. 2. 98. tab. 49. "Leaves heart-shaped, three-lobed, tomentous, with two glands underneath at the base." A tall tree. *Branches* cylindrical, tomentous-hoary at the top. *Leaves* clustered towards the ends of the branches, alternate, nine inches long or more, thinly and slightly toothed, tomentous on both sides with stellated hairs, whiter underneath, soft; lobes egg-shaped, acute, middle one elongated; petiole one-third the length of the leaf. *Raceme* about a span long, terminal, erect, tomentous. *Flowers* numerous, scattered, males intermixed with females; germ hirsute, hoary. A native of the island of Trinidad. 74. *C. capense*. Linn. jun. Supp. 422. Mart. 21. Willd. 68. Thunb. prod. 117. "Leaves three-lobed-hastate, and lanceolate, quite entire. A native of the Cape of Good Hope. 75. *C. senegalense*. Lam. 33. Willd. 67. "Leaves hastate-oblong, tomentous underneath; flowers crowded, almost sessile; capsules scaly-shining." *Branches* slender, cylindrical, with a brown bark, clothed with scattered stellated hairs, white and almost tomentous near the top. *Leaves* generally alternate, scarcely an inch long, on short petioles. *Flowers* near the top of the branches; styles erect, tomentous on the outside. *Capsules* globular, with three roundish lobes; covered with white, silvery, orbicular scales, which are dotted in the middle. Found by Adanson in Senegal. 76. *C. trilobatum*. Willd. 72. "Leaves three or five-lobed, serrated, pubescent underneath; petioles pubescent." Exactly similar to *C. lobatum* (n. 96.) except in its woody stem, and the pubescence of its leaves and petioles; stamens ten, not united.

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77. *C. castaneifolium*. Linn. Sp. Pl. 1. Mart. 3. Lam. 36. Willd. 9. (*Ricinoides, castanææ folio*; Plum. Sp. 20. Tournef. 656. Burm. Amer. tab. 239. fig. 1. *Acalypha australis*;

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australis; Linn.?) About three feet high. *Root* spindle-shaped, the length and thickness of the finger, white, fungous, fibrous. *Stem* cylindrical, appearing woody, but tender and full of pith, greenish, rough with stiff sharp hairs; branches somewhat zig-zag. *Leaves* alternate, near six inches long, sometimes pointed, nerved. *Spikes* axillary, on hispid peduncles; male flowers small, uppermost; calyx five-cleft; petals five, white; females below; calyx hispid, with six segments alternately larger and smaller. *Fruit* hispid, roundish, tricapular. Found by Plumier in St. Domingo. 78. *C. palustre*. Linn. Sp. Pl. 2. Mart. 4. Lam. 57. Willd. 11. (Rhinoides palustre; Mart. Cent. tab. 38.) "Leaves ovate-lanceolate, plaited, serrated scabrous." *Root* annual. *Stem* about a foot high, flattened, green, procumbent or erect. *Leaves* two or three inches long, about a quarter of an inch broad, smooth on both sides, striated by several lateral nerves; petioles half an inch long. *Flowers* in axillary spikes two inches long; males four or five, uppermost; females three or four. *Capsules* about the size of a pea, rough with warts or soft little spines, sessile. Raised by Miller from seeds sent by Dr. Houston, who discovered it near La Vera Cruz. Its appearance is much altered by cultivation. 79. *C. tricuspidatum*. Lam. 34. (*C. lanceolatum*; Willd. 6. Cav. ic. 6. 38. tab. 557. fig. 2.) "Leaves oblong-lanceolate, finely toothed, three-nerved; petals tricuspidate." *Stem* four or five feet high, erect, a little branched, slightly hispid with a few scattered stiffish hairs; branches striated, filiform. *Leaves* alternate, a little hispid at the edges, smooth on the surface, on short petioles. *Peduncles* axillary, many-flowered, shorter than the leaves; calyx of the male flowers with five or six lanceolate leaves; petals white, the length of the calyx (half the length; Cav.), with three (sometimes four; Cav.) points or teeth at the tip; glands five, small, attached to the receptacle of the calyx; filaments five, united at the base; females at some distance from the males; corolla none; germ roundish, villous; stigmas reflexed. Dombey Herb. and MSS. A native of Chili. 80. *C. microphyllum*. Lam. 35. Willd. 17. "Leaves oval, obtuse, entire, smooth; little branches and petioles rough with hairs; flowers lateral." Scarcely a foot high, much branched, panicled, in its foliage somewhat resembling *phyllanthus niruri*. *Branches* filiform, rough with small hairs, which are frequently terminated by glands. *Leaves* small, petioled, bright green. *Flowers* in very small, few-flowered, lateral racemes; leaves of the calyx five, lanceolate, expanding, often reflexed; filaments from five to seven, united at the base; styles six, simple. *Capsules* small, globular, smooth when ripe, with three two-valved cells. Found by Dombey in Peru. 81. *C. glandulosum*. Linn. Sp. Pl. 7. Mart. 7. Lam. 40. Willd. 26. Jacq. Ic. Rar. 1. tab. 194. (*C. scordioides*; Lam. 45. *C. minus* trichotomum; Brown. Jam. 346. *C. annum erectum*; Mich. Amer. 2. 214.) "Leaves oblong, serrated, nearly entire at the base, rough with hairs underneath, with two glands at the base; stem trichotomous; spikes lateral." A foot high or more. *Root* annual. *Stem* slender, hard, villous. *Leaves* alternate, opposite at the division of the branches, petioled. *Flowers* almost sessile, clustered in very short spikes in the forks of the branches and the axils of the upper leaves; males very small, from two to five, with about eight stamens; females two or three, very hispid; calyx with five spatulate divisions; germ villous, roundish. A native of Carolina, Jamaica, and Brazil. 82. *C. acutum*. Mart. 11. Willd. 41. "Leaves egg-shaped, serrated, acuminate, smooth, with two glands." *Root* annual. *Stem* angular, simple, smooth. *Leaves* alternate, unequally serrated, three or four inches long, two inches broad; petioles a finger's length; glands on the edge of the leaf above the base. *Flowers* in axillary, loose, angular, smooth racemes; males uppermost; calyx with five, lanceolate, smooth, spreading, deep divisions; petals white, woolly, the length of the calyx; filaments about twelve; females; corolla none; germ egg-shaped, villous; styles five; stigmas simple, obtuse. *Capsules* pedicelled, trigonous, obtuse, villous. Cultivated in Japan. 83. *C. capitatum*. Willd. 30. "Leaves oblong-oval, obtuse, rounded at the base, entire, tomentous on both sides; female flowers clustered in a kind of head at the base of the spike." Petioles, little branches, calyxes, and capsules tomentous-woolly. *Stem* erect. A native of North America, in the country of the Illinois. 84. *C. argenteum*. Linn. Sp. Pl. 8. Mart. 8. Lam. 41. Willd. 31. "Leaves cordate-egg-shaped, entire or slightly serrated, tomentous underneath; stipules ciliated; spikes terminal, somewhat capitate, bracteate." *Root* annual. *Stem* from eight inches to a foot high, pubescent, whitish, forked or trichotomous at the summit. *Leaves* petioled, alternate on the stem, opposite at the ends of the branches, soft, greenish above, with short stellated hairs which make them appear finely dotted, tomentous and almost silvery underneath. *Flowers* white, clustered, in short terminal spikes; bractes three, oval, hispid, toothed. A native of South America, about Vera Cruz. 85. *C. hirtum*. Mart. 28. Lam. 38. Willd. 27. Herit. Stirp. 17. tab. 9. "Leaves egg-shaped, serrated, with glanduliferous hairs at the base; spikes sessile; stem hispid." *Root* annual. *Stem* erect, cylindrical, glandular, with stellated hairs on each gland, dichotomous or trichotomous at the top. *Leaves* about three inches long, two and a half broad, alternate, except the uppermost, spreading, unequally serrated, acute, with three principal nerves, veined, wrinkled, hispid on the nerves, pale green on both sides, with a few pedicelled glands on the edge at the base, not on the petiole; stipules two, awl-shaped, hairy, permanent, surrounded at the base by several sessile glands. *Flowers* of a dusky herbaceous colour, sessile, clustered in short spikes both terminal and from the forks of the branches; bracte under each flower, the length of the calyx, linear, ciliated on each side, with three glandular hairs; males above; calyx five-leaved; corolla five-petalled; filaments ten; females below; calyx five-leaved; corolla none. *Capsule* rugged, rough with hairs. It differs from *C. palustre* in having sessile spikes, not axillary; and leaves three-nerved, not plaited, nor the nerves parallel: from *C. glandulosum* in having pedicelled glands. A native of Guiana. 86. *C. urticifolium*. Lam. 39. Willd. 49. "Leaves egg-shaped, somewhat cordate, acute, serrated, petioled; spikes hairy, terminal; calyxes reflexed." About a foot high. *Stem* cylindrical, tubular, branched and dichotomous in its upper part, clothed with white hairs near the summit. *Leaves* somewhat resembling those of *urtica dioica*, the common stinging nettle, or of *lamium album*, the white dead nettle, alternate, green on both sides, set with short stellated hairs chiefly on their nerves and upper surface. *Female flowers* pedicelled, segments of the calyx five, egg-shaped, obtuse, villous and whitish on the outside, dull red within; germ trigonous, woolly and whitish; styles six, deeply bifid, coloured. Found by Commerçon in Brazil. 87. *C. morifolium*. Willd. 10. "Leaves roundish-egg-shaped, acute, finely serrated, obsolete heart-shaped, petioled, pubescent underneath; spikes at the top and in the forks of the branches." *Branches* dichotomous, smooth. Calyx of the female flowers villous. *Capsule* pedicelled, set with scattered stellated hairs. Found by Humboldt in South America. 88. *C. triquetrum*. Lam. 43. Willd. 24.

"Leaves

C R O T O N.

“Leaves ovate-oblong, acute, finely serrated, tomentous; petioles decurrent with a tomentous-woolly line.” A foot or a foot and half high. *Stem* slender, herbaceous, but rather hard. *Leaves* three or four inches long, alternate, sometimes almost opposite, rounded at the base, with two small glands near the petiole, soft, nearly smooth and finely dotted above, tomentous and reddish-white underneath; petioles woolly and reddish. *Spike* terminal, dense, short, sessile, tomentous, ferruginous; flowers sessile; stamens ten or twelve. Found by Commerçon in Brazil. 89. *C. chamædrifolium*. Lam. 44. (*Tragia mercurialis* β & *acalypha indica* β ; Linn. *Acalypha reptans*; Willd. *Mahihot minima chamædrifolia*; Plum. Sp. 20. *Burm. Amer. tab. 172. fig. 2.* *Urtica minor incris spicata*; Sloan. *Jam. Hist. 1. 125. tab. 82. fig. 3.* *Tiaelpatlis*; Hern. *Mex. 293*) “Leaves somewhat heart-shaped, serrated, smooth; spikes terminal.” *Stems* several, four or five inches long, slender, short, more or less erect, branched, leafy. *Leaves* alternate, petioled, bright green. *Flowers* very small; males uppermost; calyx purple, with four divisions; stamens numerous, very white; females; calyx with eight divisions; germ roundish, trigonous; styles three, villous. *Fruit* reddish, vilous, tricapular. A native of St. Domingo and Jamaica. 90. *C. ricinocarpus*. Linn. Sp. Pl. 17. Mart. 18. Lam. 46. Willd. 58. (*Mercurialis androgyna*; Vir. Clif. 98. Roy. Lugdb. 203. *Ricinocarpos americana*, flore albo spicata; Boerh. Lugdb. 1. 254.) “Leaves somewhat heart-shaped, crenate; peduncles in racemes opposite to the leaves.” *Root* annual. *Stem* an inch high; branches alternate. *Leaves* alternate, petioled, smooth. *Flowers* in distinct clusters, males and females intermingled; common peduncle longer than the leaves; calyx three-leaved, narrow, white. A native of Surinam. 91. *C. tinctorium*. Linn. Sp. Pl. 6. Mart. 6. Lam. 42. Willd. 20. Gært. tab. 107. (*Ricinoides ex qua paratur Tournesol Gallorum*; Tourn. *Inst. 655.* *Nissol. Aët. 1712. p. 339. tab. 17.* *Heliotropium*; Bauh. *Pin. 253. Rai. Hist. 165.* *H. minus tricoccum*; Cluf. *Hist. 2. 47.* *H. parvum Dioecorides*; Lob. *IC. 161.*) “Leaves ovate-rhomboidal, repand, quite entire at the base, hoary on both sides; racemes terminal; capsules squamous-pubescent, pendulous.” *Root* annual. *Stem* a foot high, cylindrical, branched, sometimes dichotomous, leafy, tomentous, whitish. *Leaves* near two inches long, one inch and a quarter broad, alternate, undulated, often plaited, clothed with short stellated hairs; petioles slender, near four inches long. *Flowers* in short sessile racemes, at the extremity and in the forks of the branches; males most numerous, almost sessile; calyx tomentous, five-leaved; petals five, lanceolate; stamens eight, monadelphous; females on rather long peduncles. *Capsule* roundish, three-furrowed, tricoccous, tubercled. A native of the south of France, Spain, Italy, and Barbary. It is from the juice of this plant, called heliotropium or turnsole by the old botanists, that the colouring matter is obtained which is sold by the druggists under the name of turnsole, and not from the *helianthus annuus*, our common garden sun-flower, as some have erroneously supposed. See TURNSOLE. 92. *C. plicatum*. Mart. 43. Willd. 21. Vahl. *Symb. 1. 73.* (*C. tinctorium*; *Burm. Ind. 304. tab. 62. fig. 1. β Lam.*) “Leaves egg-shaped, obtuse, plaited, crenate, hirsute, hoary underneath, with two glands at the base; racemes few-flowered, terminal.” *Root* annual. *Branches* cylindrical, somewhat scabrous, hoary, hirsute on the upper part, with dense stellated hairs. *Leaves* resembling those of heliotropium supinum, half an inch long or more, wrinkled, rounded at the tip; petiole the length of the leaf, with a

purplish gland at its top, and two underneath at the base of the leaf. Inflorescence as in the preceding species. *Capsules* violet purple, pendulous. A native of Arabia Felix and the East Indies. 93. *C. obliquum*. Mart. 44. Willd. 22. Vahl. *Symb. 1. 78.* (*C. argenteum*; Forsk. *Ægypt. 75. n. 491*?) “Leaves ovate-lanceolate, quite entire, tomentous, without glands; stem tomentous.” Nearly akin to the preceding, but the hairs are less distinct, so that the whole plant appears tomentous; the leaves also are narrower and oblique on one side at the base. A native of Egypt. 94. *C. verbasifolium*. Willd. 23. (*Ricinoides ex qua paratur Tournesol Gallorum folio oblongo & villosa*; Tourn. *Cor. 45*.) “Leaves ovate-oblong, repand, petioled, tomentous on both sides, soft; racemes terminal; capsules scaly-pubescent, pendulous.” *Root* annual. *Stem* dichotomously branched, densely clothed with a white cottony down. *Leaves* two or three inches long. *Flowers* on long peduncles in proportion to the length of the raceme. *Capsules* purple, covered with white scales. Perfectly distinct from *C. tinctorium*. A native of Greece and the East. 95. *C. japonicum*. Linn. *jun. Supp. 422.* Mart. 10. Willd. 69. Thunb. *Jap. 270. tab. 28. 29.* “Leaves rhomboid-egg-shaped, acuminate, either quite entire, or a little three-lobed, smooth, five-nerved; racemes panicled, pubescent.” *Root* annual. *Stem* a foot high, simple, somewhat angular, tomentous near the top. *Leaves* alternate, peduncled, reticularly veined. *Racemes* sometimes solitary. A native of Japan. 96. *C. lobatum*. Linn. Sp. Pl. 19. Mart. 22. Lam. 47. Willd. 71. (*Ricinoides herbaceum, foliis trifidis f. quinquefidis*; Mart. *cent. tab. 46*.) “Leaves unarmed-ferrated; lower ones five-lobed, upper ones deeply three-lobed.” About a foot high. *Root* annual. Upper part of the stem, petioles, nerves of the leaves, and peduncles, rough with rather long white hairs. *Stem* leafy, with short alternate branches. *Leaves* generally alternate, soft, green above, hairy underneath, but only on the nerves; stipules awl-shaped. *Flowers* in lateral, slender, solitary spikes, a little shorter than the branches, males uppermost, small; calyx five-cleft, purple; petals five, very small, purple; females without a corolla; styles purple, fringed at the end, permanent. *Capsule* smooth, the size of a horse bean. Found by Houston about Vera Cruz in South America. 97. *C. spinosum*. Linn. Sp. Pl. 20. Mart. 23. Lam. 48. Willd. 74. (*Ricinus maderaspatanus*; Pluk. *Alm. 320. tab. 108. fig. 3*.) “Leaves palmate, five-lobed and three-lobed, spinous-ferrated; flowers close pressed to the stem, nearly sessile.” A native of the East Indies.

CROTON benzoe; Linn. *Mant. and Mat. Med.* Willd. See STYRAX benzoin.

CROTON eleuteria; Willd. See CLUYTIA eleuteria.

CROTON foliis cordatis serratis; Gron. See TRAGIA mercurialis.

CROTON foliis ovato-lanceolatis; Roy. Lugdb. See TRAGIA involuocrata.

CROTON hastatum et urens; Linn. See TRAGIA cannabina.

CROTON lobatum; Forsk. See JATROPHA glauca.

CROTON spinosum; Forsk. See JATROPHA spinosa.

CROTON variegatum; Forsk. See JATROPHA variegata.

CROTON villosum; Forsk. See JATROPHA glandulosa.

Obf. La Marck justly observes, that the generic distinctions of croton, tragia, and acalypha, are purely artificial, and that they sometimes separate plants which, on a general comparison of their natural characters, will be found closely allied. He adds, that he sees no good reason why *jatropha gossypifolia*, f. curcas, and some others are not placed

placed among the crotons. It is evident, from the enumeration of species given above, that, as far as croton is concerned, these artificial distinctions have by no means been carefully observed in practice; and that the whole natural order must be more accurately investigated, before its really distinct genera and their true generic differences can be determined.

Propagation and Culture.—*C. tinctorium*, (n. 91.) is the only plant of this genus which grows naturally in Europe, but being peculiar to the southern part, cannot be raised in our climate without some care and attention. The seeds should be sown in the autumn, soon after they are ripe, in a small pot filled with light earth, and plunged into an old tan bed in a frame. In the spring the pot should be put into a fresh hot-bed, and when the plants are fit to remove, which will be in about a month, they should be set separately in small pots, plunged into another fresh hot-bed, and screened from the sun till they have taken root. The air may then be daily admitted to them, according to the warmth of the season, with only a small allowance of water. By this treatment, and by this alone, Mr. Miller was able to procure perfect seeds. All the other species, being natives of warmer countries, require a greater degree of artificial heat. The shrubby kinds must always be removed into the bark-stove in the autumn, and must be kept in a good temperature through the winter, when, as their leaves are not deciduous, they make a pleasing variety among other plants. Most of them may be increased by layers or cuttings, or both.

CROTON, or *Crotona*, *Cotrone*, in *Ancient Geography*, a town of Italy, in the most eastern part of the Brutian territory, situated on a small gulf north-west of the promontory Iacium. The Phœnicians, who first traversed this coast, are said to have been the first founders of the city. But Strabo, Dionysius Halicarnassensis, and others, trace it to a Greek origin; and ascribe its foundation to Myscellus, chief of the Achæians in the third year of the 17th Olympiad, B. C. 710. This Myscellus, it is said, being come to Delphos to consult the oracle of Apollo, about the spot on which he should build his city, met Archias the Corinthian there, who was arrived upon the same account. The god gave him a favourable audience, and after having fixed the purpose of each with regard to the place that would best suit their new settlements, he proposed different advantages to them, and left them, among other particulars, the choice of riches or health. The offer of riches interested Archias, but Myscellus preferred health; and if we may credit history, Apollo faithfully performed his promise to both. Archias founded Syracuse, which soon became the most opulent city of Greece. Myscellus laid the foundation of Croton, which acquired such reputation for the long life and innate strength of its inhabitants, that its name was used proverbially to signify a very healthy spot, the air of which was extremely pure. The people signalized themselves by a great number of victories in the Grecian games; and Strabo relates, (l. vi.) that in the same Olympiad, seven Crotonians were crowned in the Olympic games, and carried off all the prizes of the stadium. Crotona was also famous for its military achievements, and its schools of philosophy. In a contest with the Sybarites, 100,000 Crotonians, headed by the famous champion Milo, over whose shoulders a lion's skin was thrown, and himself armed with a club, like another Hercules, gained a complete victory over 300,000 Sybarites, so that few escaped, and their city was depopulated. It was a proverb among the ancients, "that the last of the Crotonians was the first of the Greeks," and it was

also said, "that in comparison with Crotona, other cities were little worthy of choice." In process of time, however, its glory declined; and 130,000 Crotonians were defeated by the Locrians at the battle of Sagra. It never recovered itself from this loss. Pyrrhus, having ravaged Crotona, and the city being too spacious for its inhabitants, it was reduced almost one-half its extent: and the river *Asarus*, which traversed it before, only washed its walls. The Romans having pursued Hannibal from this coast, reduced Crotona under their dominion: and under the consulate of P. Cornelius Scipio and T. Sempronius Longus, in 559, it became a Roman colony.

Croton river, in *Geography*, a north-eastern water of Hudson's river, in North America, which rises in the town of Fairfield in Connecticut, and running through Dutchess county, discharges itself into Tappan bay. Croton bridge crosses this river three miles from its mouth, in the high road to Albany. This bridge is 1400 feet long, supported by 16 stone pillars. Croton-falls present from this bridge an interesting object; the water precipitating itself 60 and 70 feet perpendicularly, with high slate banks, in some places 100 feet; and the river spreading itself into three streams, as it enters the Hudson.

CROTONA, in *Ancient Geography*, a town of Italy, in the Tyrrhenian territory, according to Steph. Byz.; Ptolemy calls it *Cortona*, and places it in the interior of Etruria.

CROTONA, in *Geography*, a town of Naples, in the province of Calabria Ultra; 12 miles east-south-east of St. Severina.

CROTONOPSIS, in *Botany*, (so called from its resemblance to Croton.) Willd. 1672. Scrotone; Poir. Enc. Mich. Amer. Class and order, *monachia pentandria*.

Gen. Ch. *Male flowers* situated above the females. *Cal.* deeply five-cleft; segments egg-shaped, obtuse, a little concave. *Cor.* Petals five, shorter than the calyx, and alternating with its divisions, linear, oblong. *Stam.* Filaments five, the length of the calyx; anthers two-celled. *Females* below in the same spike. *Cal.* as in the male, but with awl-shaped segments. *Cor.* none. *Pist.* Germ egg-shaped; stigmas three, almost sessile, very short, bifid. *Peric.* Capsule short, small, roundish-oval, one-celled, not dehiscent. *Seed* solitary, almost globular, adhering to the upper part of the capsule; embryo reversed, like the seed, enclosed in a very thick, fleshy, oily substance.

Ess. Ch. *Male*, Calyx five-cleft; petals five. *Female*, Capsule with one seed, not dehiscent.

Sp. C. *linearis*. Willd. 1. Poir. Michaux Amer. 2. 186. tab. 46. "Leaves linear-lanceolate." A weak herbaceous plant, covered in all its parts with white shining scales like those of *Hippophaë rhamnoides*. *Stems* erect, slender, siliiform, dichotomous. *Root* annual. *Leaves* about an inch long, alternate, nearly sessile, distant, narrow, quite entire, obtuse, or very slightly acute at the summit, green above, set with minute scellated hairs. *Flowers* in small, simple, slender spikes at the extremity of the branches; some of them axillary, on very short pedicels, alternate, small, with a very short bracte at the base. A native of Carolina, and the country of the Illinois. 2. *C. elliptica*. Willd. 2. "Leaves elliptical, obtuse both at the top and the bottom." Resembling the preceding, but the spines are shorter, and the leaves only half the length, and three times the breadth, rounded above and below. A native of Carolina.

CROTOPHAGA, in *Ornithology*, a genus of *Picæ*, having the bill compressed, semi ovate, arched, and carinated on the back, upper mandible angular at each edge; nostrils

pervious;

pervious; tongue compressed, and subulate at the tip; feet, in general, formed for climbing.

Species.

ANI. Blackish-violet; feet climbers. *Crotophaga ani*, Linn. *Psittaco congener ani*, Rai. *Le Bout de Petun*, Briss. *L'ani des Savanes*, Buff. Razor-billed blackbird, Catesby. Great Blackbird, Sloan. Lesser ani, Latham.

The length of this bird is thirteen inches and a half; its colour throughout black, partially glossed with purple, and about the neck faintly tinged with green on the margins. The base of the bill is beset with black bristles, which turn forwards, and the eye-lids are furnished with long hairs resembling eye-lashes. The tail is six inches long, of a very emarginated form, and like the rest of the ani tribe, composed of ten feathers; the lefs are black, and have the toes placed two before and two behind. This curious species is found in Jamaica, St. Domingo, and other islands in the West Indies, and also in Cayenne, and other parts of South America. Contrary to all other birds they live in societies, a number of them occupying a single nest in the construction of which they labour in concert, and make it sufficiently spacious for the reception of the whole company. After laying their eggs they sit on them close to each other in order to hatch them, each unanimously endeavouring to do their best for the good of the community, and when the young are hatched, the old birds attend mutually to the wants of the whole flock. Those birds have generally two broods in a year, and sometimes even three. The eggs are about the size of those of a pigeon, and of a sea-green colour, spotted at the ends. The food of these birds consists of worms, insects, fruits, and grain, in quest of which they are usually seen in flocks of twenty or thirty together. Like the common jay, they make a chattering noise, and are in no esteem as an article of food.

MAJOR. Blackish-violet; feathers edged with green; quill feathers dusky-green; feet formed for climbing. *Crotophaga major*, Briss. *Ani des Paletuviers*, Buff. *Grand Bout de Petun*, Buff. pl. enl. Greater ani, Lath.

This species exceeds the last in point of size, being as large as the jay, and measuring eighteen inches in length. The bill is of a more lengthened form, and rises higher on the top; the colour of its plumage corresponds with the other, except in having some of the feathers edged with green. It is affirmed that these two birds never associate with each other, though the manners of both are very nearly the same. Their haunts are different, the smaller ani frequenting the open savannas, and the larger only the salt marshes near the sea-coasts. They are of a docile disposition, easily tamed, and may be taught to speak like the parrot. The male and female are alike in the colour of their plumage.

VARIA. Variegated with rufous and black; feet formed for climbing. *Crotophaga varius indicus*, Ger. Orn. Varied Ani.

Length 11 inches; bill black, and curved: head, throat, and breast black; larger and middle wing-coverts, and also the tail black, the latter long; the rest of the body tawny-rufous; legs tawny-fuscous.

AMBULATORIA. Feet formed for walking. *Crotophaga ambulatoria*, Linn. Walking ani, Lath.

This appears to be a very ambiguous species; it is described on the authority of Linnæus, who informs us that it agrees with the two first mentioned species, except in the situation of the toes, which are placed three before, and one behind. The bird, according to Linnæus, is found in Surinam.

CROTOPHAGA, a name given by Forskal (Fann. Arab.) to the tock of Buffon, the black-billed hornbill of Latham, and the *Buceros nasurus* of Gmelin.

CROFORD, a town of Germany, in the circle of Westphalia, and duchy of Berg; 11 miles east-south-east of Homberg.

CROTOY, I.E. a small town of France, in the department of the Somme, not far from the mouth of that river; 15 miles north-west of Abbeville.

CROTTENDORF, a village of Saxony, in the circle of Leipzig, at a very little distance from Leipzig, which, together with *Anger* and *Reudnitz*, two other villages, goes by the general name of the *Kohl gärten*, (cabbage gardens), and constitutes one of the favourite walks of the inhabitants of Leipzig, and of the numerous strangers who visit that city at the time of its fairs. The fields of these villages are particularly devoted to horticulture, and are supposed to yield above twenty pounds sterling an acre annually.

CROTZKA, a town of Hungary, on the south side of the Danube, where a severe and destructive battle was fought in the year 1739, between the Imperialists and the Turks; it is 15 miles south-east of Belgrade.

CROU. See **CROULD**.

CROUCHE, a river of England, in the county of Essex, which runs into the sea; 10 miles north-east of Rochford, celebrated for its oyster-beds.

CROUCH-HILL STATION, near Banbury, in Oxfordshire. In the centre of the flat on the top of this noted hill, a station was chosen in 1799 for the government trigonometrical survey, and its situation was determined by an observation from Brill, distant 102,608 feet, bearing $39^{\circ} 20' 49''$ south-east from the parallel to the meridian of Dumfries, and another from Epwell distant 29,669 feet; whence is deduced its latitude $52^{\circ} 2' 59''.6$ N., and longitude $1^{\circ} 21' 11''.6$, or $5^{\text{m}} 24.7$ W. of Greenwich. This station was used with Epwell for determining the following places, viz. Adderbury spire, Aynhoe, Bloxham, Deddington, and Farthinghoe churches.

CROUCH river, in Essex, is navigable from the Thames, near its mouth at Foulness point, to Haul bridge. See **CANAL**.

CROUGH-NA-MALLEN, mountains in the northern part of the county of Mayo, Ireland.

CROULD, or **CROU**, LA, a small river of France, in the department of the Seine, which has its source near Tillay, and falls into the river Seine near St. Denys, six miles north of Paris.

CROUP, in *Medicine*, a disease of children, characterized by difficult breathing, with a peculiar ringing or croaking sound of the voice in speaking and coughing.

It may seem extraordinary, that a disease, so distinctly marked, should not have been accurately described before the middle of the 18th century. Authors, indeed, had noticed a dangerous angina, in which no tumour was to be seen in the neck or throat; but the peculiar symptoms of croup were not observed. Dr. Home of Edinburgh was, perhaps, the first to give a distinct account of the disease, in his treatise on the *suffocatio stridula*, or croup, in 1765. Michaelis, however, who afterwards published a work on this subject, calling the disease *angina polyposa sive membranacea*, Argentorato, 1778, says, that Martin Ghis, an Italian physician, published the first regular history of croup, in his "Lettre Mediche," Cremona, 1749. The disease is now well known in this country, especially on some parts of the sea-coast; but the inland counties are by no means free from it.

Croup seldom attacks infants before they are weaned; but after being weaned, the younger they are the more they are liable to it. As children advance in age, they are less subject to its attacks, and are rarely affected with it after the age of twelve years. But Dr. Cheyne saw the croup in a child of three months old at the breast; (Essay I. on the Diseases of Children, Edin. 1801.) and Mr. Rumsey observed it in a boy of thirteen, and in a girl of fourteen years of age. (Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. ii. p. 25.) Although it often attacks several children in the same family, it does not appear to be contagious. Mr. Rumsey remarks, in the excellent paper just quoted, that only one child in the workhouse at Chesham had the disease, when it was epidemic in that part of Buckinghamshire, although there were between twenty and thirty in the house; and similar exemptions occurred in families, where no pains were taken to prevent the intercourse between the sick and the healthy.

The croup generally begins with a short dry cough, wheezing, and other catarrhal symptoms, the general health not appearing to suffer. Soon, however, the wheezing becomes more observable, the cough more troublesome, and marked by a peculiar shrill sound, the respiration is performed with a wheezing or croaking noise, and at length grows very distressing and laborious. "At the beginning, or in slighter cases," says Mr. Rumsey, "the sound of inspiration resembled the passing of air through a piece of muslin; afterwards it was as if the noise came from a brazen tube. The cough was attended with a peculiar shrill sound, even at an early period of the disease, as well as the voice, where there was not a perfect hoarseness. Dr. Home describes it "vox instar cantus galli." I have heard those about the sick compare it to the noise which a fowl makes when caught in the hand. This peculiarity, however, is not easily expressed by words, but a knowledge of it is readily acquired by observation. I have known the sound of the cough alone greatly shock an unfortunate parent, who had already lost one child with the complaint."

By the end of the second, or on the third day, sometimes sooner, symptoms of affection of the system take place, as white tongue, thirst, increased heat, and frequent pulse; and the disease advances rapidly, not merely from violent general affection, but from the influence which it has upon the organs of respiration; the difficulty of breathing becoming now very distressing, the countenance being often flushed, and great inquietude and a continual inclination to change from place to place supervening. The child at the same time eagerly puts its fingers into its mouth, as if to pull away something which sticks in the passage.

All the symptoms are increased during the night, throughout the disease.

The cough is at first dry; but by the third day or sooner, the passage of the air is obstructed by viscid matter in the trachea, some of which is occasionally thrown up by coughing or retching. Occasionally also, portions of a film or membrane, of a whitish colour, are thrown up by violent coughing or retching; and the efforts made to dislodge it are often so distressing, that the child appears to be almost in a state of strangulation. This is succeeded by an abatement of all the symptoms, until a fresh quantity of the same substance is formed, when the distress recurs as before.

In many cases, the difficulty of breathing and appearance of suffocation are increased by paroxysms, so as to occasion extreme anxiety and inquietude, and suggesting the idea of spasm. And in other cases the disease, after continuing some time, appears suddenly alleviated; the breathing is

free, cheerfulness, appetite, and a disposition to amusement, take place. But a change, for the worse, comes on as suddenly, and death ensues; the livid and swelled face, and convulsive struggles, giving the little patient every appearance of one actually strangled.

When the internal fauces are viewed, as Dr. Cullen has observed, they are sometimes without any appearance of inflammation, but frequently a redness and swelling appear. But Mr. Rumsey remarks, that most of the cases which occurred in the winter were attended with inflammation and swelling of the tonsils, uvula, and velum pendulum palati; and frequently large films of a white substance were formed on the tonsils. The swallowing, however, was usually less impeded than might have been expected.

It is important to observe, that the danger in this disease is not to be estimated by the general state of the body; for there may be imminent danger, although hardly any symptoms of general disease have been noted. Those who expect to meet with a considerable affection of the system, will not be aware that so formidable a disease has begun its progress; since, for the first day or two, the child has only a slight cough and hoarseness, is in good spirits, perhaps even running about the room, and enjoying its amusements. The skin is often hot and dry, as the disease increases; but sometimes it is moist and relaxed throughout. Several instances of croup, terminating fatally in twenty-four hours, are recorded: more frequently, however, the child does not die before the third or fourth day, sometimes much later. When it terminates favourably, generally after having arrived at its height, a moisture is poured out on the skin, the fever declines, and the *croupiness*; and, lastly, the cough gradually wears away, after an expectoration of films and matter from the wind-pipe.

The croup, as has been invariably evinced by dissection, consists in an inflammation of the internal membrane of the wind-pipe; in consequence of which, a white pus-like matter is poured out, which ultimately is converted into a sort of membrane, of considerable tenacity. This impedes respiration, and finally suffocates the patient. This membranous lining appears to arise a little under the larynx, and is sometimes prolonged into the division of the trachea; and generally a quantity of a white fluid, like that brought up by the cough, is seen gurgling up on dissection. The attachment of the membrane is slight; and it is often found lying in a great measure loose in the trachea. This fact is commonly found free from any erosion or ulceration; but it frequently shews the vestiges of inflammation, and is covered with the white matter before mentioned.

As the disease is hence considered to be a peculiar inflammation of the trachea or wind-pipe, the usual remedies of inflammation have been generally adopted, and, when early employed, have often proved effectual. Bleeding, both general and topical, has often given immediate relief; and, by being repeated, has entirely cured the disease. The application of blisters to the external fauces has likewise been found beneficial. Vomiting, after blood-letting, seems to have been of frequent advantage, and sometimes suddenly relieves the disease, by promoting the discharge of the matter exuding from the lining of the trachea, or of the membrane, if already formed. The warm bath; fomentation, and the inhalation of the vapour of hot water, have been also used with occasional benefit.

All these expedients, however, too often fail of arresting the progress of this fatal disease. In addition to these, Mr. Rumsey administered cicuta; and also ether, in small and repeated doses, where the heat did not forbid it, and when some spasmodic affection appeared to accompany the other

symptoms. But these were equally ineffectual. Dr. Cullen, indeed, had already observed, that although he supposed that a spasm of the glottis is often fatal in croup, he had not found antispasmodic medicines of any use. Children are very averse to expectorate, and emetics afford the only means of dislodging the matter which collects in the trachea; the relief, thus obtained, is, however, commonly temporary only. After losing several patients, under these modes of treatment, Mr. Rumsley had recourse to the use of calomel, in the dose of from half a grain, to a grain or more, every four hours, accompanying it, in some cases, with mercurial friction. Under this management, he succeeded in carrying the disease to a safe termination in a number of instances. The cases are related at length. (*loc. citat.*) He concludes, however, with these candid and philosophical observations. "More extensive experience than I have yet had is requisite to determine whether, in mercury, we shall find a certain remedy for the disease. With regard to the above cases, it should be observed, that some recovered when mercury was not administered, or in such quantity as not to produce any effect; and in two patients, under the care of my brother, it was given unsuccessfully. Moreover, the disease was less severe towards the end of the epidemic constitution, which was the period when we adopted this plan: so that, admitting that all those patients, who recovered under such treatment, were *cured by mercury*, it does not follow that the same effects would have been produced, had it been given in the early cases; yet it surely merits farther trial, the ordinary mode of treatment being so unsuccessful." See *Trans. of a Soc. for the Improvement of Med. and Chir. Knowledge*, vol. ii. Cullen, *First Lines*, § 318. Home on the Croup. Michaëlis de Angina Polypola.

CROUP of a horse, in the *Manege*, the extremity of the reins above the hips. It should be large and round, so that the tops of the two haunch bones be not within view of each other. It should have its compass from the haunch bones to the very dock, or onset, of the tail; and should be divided in two by a channel, or hollow, all along to the neck. A rocking croup is when a horse's fore-quarters go right, but his croup swings from side to side; when such a horse trots, one of the haunch bones will fall, and the other rise like the beams of a balance; a sign that he will not be very vigorous.

CROUPADE, a leap in which the horse draws up his hinder legs, as if he meant to shorten and truss them up under his belly. See **BALLOEËDE**.

CROUPER, or **CRUPPER**. See **CRUPPER**.

CROUPIERE, in *Geography*, a small town of France, in the department of Puy-de-Dôme, on the river Dore; 24 miles E. of Clermont.

CROUSAZ, JOHN, PETER DE, in *Biography*, a Swiss divine, was born at Lausanne in the year 1669. He was intended, by his father, for the military line, and was accordingly instructed in all those branches of knowledge that are necessary to that profession. His attachment to literature and science was soon conspicuous, and he was allowed to follow the bent of his inclination, under very able professors at Geneva and Lausanne. Here he studied very diligently mathematics, philosophy, and theology, and in 1682 he sought farther improvement at Leyden, and from thence he went to the university at Paris, where he became acquainted with father Mallebranche, and other eminent characters. Two years afterwards he was ordained minister, and appointed professor. During 14 years he continued pastor of the church of Lausanne, and was exemplary and indefatigable in every undertaking. At this place he obtained other preferments, and in 1724 he was

appointed mathematical and philosophical professor at the university of Groningen, and shortly after was elected a foreign member of the royal academy of sciences at Paris. He was next appointed tutor to prince Frederic of Hesse Cassel, an office which he filled with great reputation till the year 1732, when, on account of his excellent character, he was nominated counsellor of embassies to the king of Sweden, uncle to his pupil, attended with a suitable salary. In 1737 he was elected professor of philosophy and mathematics in the academy of Lausanne, with the power of appointing a substitute, when either his health or increasing years should render such assistance necessary. He died in the year 1748, leaving behind him a high reputation as a scholar and a Christian. His works are very numerous, and on various branches of literature; but he is chiefly distinguished for his treatises on Logic, of which the principal is entitled, "A System of Reflections that may contribute to the Illustration and Extension of Knowledge, or a new Essay on Logic." This was first published in two vols. 8vo. and afterwards enlarged, and appeared in the duodecimo form in six volumes. He was an able defender of the Christian religion, and engaged in the well-known controversy with Anthony Collins. We have treatises likewise from the pen of Croufaz on geometry, algebra, and on several branches of metaphysics and polite literature. Moreri.

CROUTE, **SOUR-CROUTE**, or *Kroute*. As this preparation of cabbage has been found of sovereign efficacy as a preservative in long voyages from the sea-scurvy, it may not be unacceptable to give a concise account of the process for making it, according to the information communicated by an ingenious German gentleman.

The soundest and most solid cabbages are selected for this use, and cut very small, commonly with an instrument made for this purpose; not unlike the plain which is used in this country for slicing cucumbers. A knife is used, when the preparation is made with greater nicety. The cabbage thus minced is put into a barrel in layers, hand high, and over each is strewed a handful of salt and carraway seeds; in this manner it is rammed down with a rammer, *stratum super stratum*, till the barrel be full; when a cover is put over it, and pressed down with a heavy weight. After standing some time in this state, it begins to ferment; and it is not till the fermentation has entirely subsided, that the head is fitted to it, and the barrel is finally shut up, and preserved for use. There is not a drop of vinegar employed in this preparation. The Germans write this preparation in the following manner: Sauer kraut, or saurer kohle, that is, in their language, sour herb, or sour cabbage. See **BRASSICA**.

CROUTILLE, in *Geography*, a town of France, in the department of the Vienne, and district of Poitiers; $1\frac{1}{2}$ league S.W. of Poitiers.

CROUY, in Latin *Croziacum*, a small town of France, in the department of Seine and Marne, near La Ferté Milon; 12 miles N.E. of Meaux.

CROUZILLE, a small town of France, in the department of the Upper Vienne; nine miles S.E. of Limoges.

CROW, in *Agriculture*, the name of an iron bar, which is constructed with a claw at one end, and a sharp tapering point at the other, by which means it is capable of being employed as a lever, as well as a tool for forming holes in the ground for the reception of stakes, truncheons, &c. in making hedge fences.

Crow, *Cornix*, in *Ornithology*. See **CORVUS**. Virgil says that the croaking of the crow foreboded rain:

"Tum cornix plena pluviam vocat improba voce."

And it was thought to be a bird of bad omen, when seen on the left hand:

“ Sæpe sinistra cava prædixit ab illice *cornix*.”

England formerly abounded with crows: and in the reign of Henry VIII. an act was passed for their destruction. The crow is a bird which is partly injurious and partly beneficial to the farmer. See **ROOK**.

CROW, in *Mechanics*, an iron lever, furnished with a sharp point at one end, and two claws at the other. It has various uses, in heaving or purchasing great weights.

The name *crow*, or *raven*, *corvus*, was anciently given to several machines of war, used in the defence of places: one invented by Diades; another by the Tyrians, mentioned by Q. Curtius; another by Cn. Ovilius. Vitruvius calls the first the *demolishing crow*, *corvus demolitor*, and also *doprædator*: others call it the *crane*, *grus*. Polybius describes another invented by C. Duilius used against the Carthaginian fleet. They were all a kind of grappling-hooks; serving to drag things towards the engineer. That described by Q. Curtius was thrown out of a balista. See **CORBEAU** and **CORVUS**.

CROW-bar, a name often provincially applied to an iron crow or lever. See **CROW**.

CROW-berry, in *Botany*. See **EMPETRUM nigrum**.

CROW's-bill, an instrument used by surgeons, in their operations; especially for drawing bullets and other foreign bodies out of wounds. It has its name from its figure.

CROW creek, in *Geography*, a creek of America, which falls into the Tennessee, from the north-west, opposite the Crow town, 15 miles below Nickajack town.

CROW's-feet, in the *Military Art*. See **CALTROP**.

CROWS-feet, in a *Ship*, are small ropes, or lines, sometimes six, eight, or ten, reeved through the dead man's eye. They are used to suspend the awnings; or to keep the top-fails from fretting against the edges of the tops.

CROW foot, in *Botany*. See **RANUNCULUS**.

CROW-foot-Crane's-bill, in *Agriculture*, the common name of a plant of the perennial weed kind, (*Geranium pratense*), which is frequent in moist meadows and pastures. It has the stalk or stem, from two to three feet in height, of a reddish tinge, and forked or divided into two branches. The leaves are much divided, and the flowers large, flat, and of a blue colour. It has the denomination of crane's-bill probably from the bill-like form of the seed vessel.

CROW foot, a name given to different plants which are met with in meadows, fields, and pastures, by farmers, as the common pilewort (*ranunculus ficaria*); the lesser spearwort (*ranunculus flammula*); the narrow leaved crow-foot (*ranunculus reptans*); the round or cekry-leaved crow-foot (*ranunculus sceleratus*); the butter flower or butter-cups (*ranunculus acris*); the small-flowered crow-foot (*ranunculus parviflorus*); the gold-cup or bulbous crow-foot (*ranunculus bulbosus*); the creeping crow-foot (*ranunculus repens*); and the corn crow-foot (*ranunculus arvensis*). The first, according to the author of the Gloucestershire Report, has the roots knotty, rising little above the ground, and blossoming early in the spring, being principally found in such meadows as are rather moist, and eaten only by sheep. Withering remarks that the young leaves of this species may be eaten in the vernal months with other pot-herbs. It is asserted that goats and sheep eat it; while cows and horses reject it. Also, that the *curculio dorialis* is found upon it.

The second species is an inhabitant of meadows of the boggy kind, and the borders of small rivers. It is a plant

which is extremely acrid in its quality, so as when applied externally to inflame and blister the skin. The water distilled from it produces the most speedy vomiting, even more so than white vitriol, so as to be a proper remedy in cases of poison. According to Withering, horses eat it; while cows, sheep, goats, and swine refuse it.

The third sort is found on the stony borders of some extensive plats of water, and sometimes in fields somewhat inclined to moisture.

The fourth species is likewise found in watery situations. Every part of it is of a corrosive quality. It is eaten by goats; but cows, horses, and sheep refuse it, according to the author of the “Systematic Arrangement of British Plants.”

The fifth kind is very commonly met with in pastures and meadow lands. It is also very acrid, readily producing vesications on the skin. Linnæus states that sheep and goats eat it; but that cows, horses, and swine reject it; the two former leaving it untouched even under the most bare state of the pasture, in the opinion of Withering.

The sixth species is common both in meadows and corn fields, where the soil is of the gravelly kind. In the latter it is sometimes very troublesome.

The seventh sort is very common in meadows and pastures: and,

The eighth kind is found in these places, as well as in garden grounds where the situation is moist.

It is remarked by Mr. Pitt, in an excellent paper in the fifth volume of “Communications to the Board of Agriculture,” that these two last, with the fifth sort, are all common in the meadows and pastures in every part of the island that he is acquainted, so much so as to give a yellow tinge to the whole surface in the month of June; very abundant in the hay grounds about London, and indeed every where else: these plants are so prevalent in our meadows and pastures, and their good qualities have been so often questioned, that it seems highly proper that their effects should be precisely ascertained.” And that these three different species are all occasionally found wild with double flowers. In this state we frequently see the *bulbosus* and *acris* cultivated in the flower garden, especially the latter; but we should, says the above writer, derive more satisfaction from informing the farmer how he might effectually root them out of his pastures, than how he might cultivate them successfully in his garden, for they propagate themselves with great facility, and occupy a considerable space in good meadows. He is however disposed to think more favourably of these plants; for he has never known a practical farmer mention them as the least injurious; and it is certain of the *repens*, that cattle eat the foliage greedily with other herbage, and that if they refuse the other sorts in bare pastures, it is probably because they have been deprived of most of their foliage with the adjoining herbage, and the remaining part of the plant is too acrid to be eaten alone; and indeed cattle refuse the flowering stems even of grasses, when deprived of their leaves: these plants may therefore, it is supposed, be considered as seasoners and correctors, being suited to uses in the animal economy similar to that of salt, mustard, pepper, and vinegar at our tables, to correct the flatulent or putrid qualities of the more palatable and luxuriant dishes of the great table of nature; and though not eaten alone, are an agreeable and useful stimulant with other more simple food. If these plants have any noxious qualities, they have, he conceives, hitherto escaped the notice of farmers, all of whom could not be supposed, with any sort of reason, devoid of proper and necessary attention.

C R O W.

Mr. Rudge, in his "Survey of the Agriculture of Gloucestershire," however, considers them, especially the creeping sort, as useless weeds, having little to recommend them to notice but their gaudy appearance. And further, that the *acris*, *bulbosus* and *repens*, are acrid and biting to the taste, and therefore rejected by cattle nearly alike, though it is asserted that the last is more mild and palatable to some cattle; he, however, suspects that cattle eat it rather from necessity than choice, as from its creeping and spreading along the surface, it becomes so matted with the herbage that it must in some measure be taken up with it. It is added, that the stems or stalks of the two other species are left standing when the ground is quite bare around them; yet that, when made with the hay, their pungent quality is said to be lost, and the brightness of the blossom in the rick is a good sign of the crop having been well harvested.

The last species is a common weed in corn fields, and it has been asserted that in Italy, cows, horses, and sheep, eat it with greediness, though it is so acrid as to prove poisonous to the latter. A dog is said to have been destroyed by three ounces of the juice in four minutes. And it is suggested that its being almost solely confined to tillage lands, where cattle are excluded, is probably the reason why mischief has not been met with from it here.

Crow-garlick. See *ALLIUM vineale*.

Crow-gold, in *Mineralogy*, is the name in Bedfordshire, and some other districts bordering on the chalk strata, for the hematites or radiated nodules of golden pyrites, which are found in the beds of chalk: when exposed to the air in the face of a chalk-pit, or on the surface, crow-golds soon decompose and turn to an ochry dirt, which ultimately falls out and leaves a stained hole in the chalk. The Totternhoe or fire-stone beneath the chalk, is apt to contain these decomposing nodules, which very much disfigure buildings where such are used.

Crow Head, a cape of the county of Cork, Ireland, forming the N. western extremity of Bantry bay. Long. 10° 2' W. Greenwich. Lat. 51° 32' N.

Crow's Meadows, a river of America, in the north-west territory, which runs north-westward into Illinois river, opposite to which are fine meadows. Its mouth is 20 yards wide, and 240 miles from the Mississippi. It is navigable between 15 and 18 miles.

Crow-Net, in *Rural Economy*, the name of an invention for catching and securing various kinds of wild-fowl in the winter-season, and which is capable of being made use of in the day-time. It is constructed of good strong double thread or packthread of a fine kind; the meshes should be two inches wide, the length about ten yards, and the depth three; it must be verged on the side with good strong cord, and stretched out very stiff; on long poles prepared for that purpose. When you come to the place where you would spread the net, open it, and lay it out at its full length and breadth; then fasten the lower end of the net all along the ground, so as only to move it up and down; the upper end of the net must stand extended on the long cord; the further end being first staked or tied to the earth by a strong cord, about five yards distant from the net. Place this cord in an even line with the lower edge of the net. The other end must be at least twenty-five yards distant, to reach into some natural or artificial shelter, by the means of which you may lie concealed from the fowl, otherwise no good success can be expected. The net must be placed in such exact order, that it may give way to play on the fowl on the least pull of the cord, which must be done smartly, lest the fowl should prove too quick for you. This net may also be used for pigeons, crows, or other birds on

corn fields newly sown; as also on stubble fields, provided the stubble conceals the net from the birds.

In this last intention, it may often be found of considerable advantage to the farmer, in preventing the feed from being too much devoured by these voracious birds.

Crow, stare, in *Ornithology*, a species of the *LARUS*; which see.

Crow-slaves, in *Agriculture*, a name given to a part of a plough, signifying two upright pieces standing perpendicularly, inserted into the box of the plough, near the wheels, and each pierced with two rows of holes; by means of which they support a transverse piece, called the pillow of the plough, running across them, and serving to raise or sink the beam, by being pinned higher or lower, according as the ground is to be ploughed deeper or shallower. See *PLOUGH*.

Crow-stone, in *Mineralogy*, is the name of a fine-grained whitish, silicious stone, found under the third coal-strata, reckoning from the mineral or mountain lime-stone upwards, much used in the neighbourhood of Swanwick, Shirland, Stretton, Wingerworth, Brampton, Dronfield, and other places in Derbyshire, and in other districts on the western border of the great run of coals, for the repair of the roads. Crow-stone has attracted the notice of most English naturalists, from the numerous and large vegetable impressions which it contains, one in particular of two to four inches or more in diameter, and several feet in length, something like a kind of reed, only that a pith or middle part of the plant is visible; but the same seldom occupies the centre of the trunk, but is sometimes seen close to, and even on the outside of the stem, the surface of which is studded over with small holes, from the bottom of which small papillæ arise. One of these curious extraneous fossils has been figured by Mr. Parkinson, *Organic Remains*, *Plate III.* *fig. 1*; who justly concludes (p. 436.), the same to belong to the *fossilia incognita*; and we are satisfied, that a further and more minute search into the carboniferous strata, will place all the vegetable remains that are imbedded therein, among the same numerous class of organized substances. See our articles *COAL* and *COLLIERY*.

Crow-stones, in *Natural History*, is a name in some places of the anomia gryphons of Linnæus, and perhaps of other species of fossil shells. Mr. Wallcott, in his "Petrefactions found near Bath," has figured one of these (*fig. 34.*), found in the quarries of free-stone near Bath: similar shells, but probably of different species, occur in great numbers in other strata. The Clunch clay stratum (see *CLUNCH*), produces plenty of crow-stones; these in some parts are found in the gravel-pits and on ploughed lands, single, and somewhat rounded, and these the ignorant and superstitious of some places denominate the devil's toe-nails! Scotchmen of the same class in the Hebrides, according to Pennant (p. 232.), wear these shells about them as an amulet, for curing pains in the joints.

Crow-Taing, in *Geography*, a cape of Scotland, on the north-west of the island of Ronaldshay.

CROWBOROUGH STATION, in the parish of that name, in Sussex, is situated on the ridge of very dislocated and elevated strata, mentioned under *COAL*, as extending from near Hastings to near Guildford; which, notwithstanding its present great elevation, is upon a stratum many hundred feet below that of the chalk strata; which, with those of the whole district called the wealds of Sussex and Kent, and a similar part of Surrey, seem to owe their exposure on their surface to an enormous abrasion or denudation of this district when elevated, as it must have been, before the removal of all the upper strata in the British series. See *DE-*

NUDATION and ELEVATION of *strata*. This station is about 600 feet south of the site of the old Beacon, and was occupied by the trigonometrical surveyors in the year 1793. Its situation was determined by an observation from Botley hill, distant 89,492.5 feet, and bearing $23^{\circ} 3' 39''$ N.W. from the parallel to the meridian of Greenwich, and another from Leith hill, distant 128,332 feet; whence is deduced its latitude, $51^{\circ} 3' 9''.4$ N., and its longitude, $0^{\circ} 9' 9''.5$, or $36''.6$ E. of Greenwich. This station was used with Botley hill for fixing the piece of Bestbeach, Crowborough chapel, East Grinstead, Fairdean, Godstone, Mayfield, Rotherfield, and Tatesfield; with Brightling station for Dallington, Nailsham, and Homechurch; with Ditchling station for Brightling church, Chittingly, Ditchling church, Firsle, Newin, Little Horstead, Plumpton, Spittal, and Waldron churches; with Fairlight station for Willington, and with Leith hill station for Ditchling station, and for Hoathly church. From Leith hill station the ground at Crowborough station appeared depressed in an angle of $13' 48''$; at Brightling station it gave an elevation of $3' 54''$; and at Crowborough station, Leith hill appeared depressed $4' 8''$, Botley hill $3' 5''$, and Brightling windmill $12' 21''$; whence was deduced the height of the ground at this station above the level of the sea, 804 feet; the calculated mean refraction with Leith hill being $\frac{1}{3}$ th of the contained arc, and with Brightling $\frac{1}{2}$ th. (See Phil. Transf. 1795, p. 583.) The situation of the Old Beacon on Crowborough hill had been determined in 1788, by an observation from Botley hill, distant 88,975 feet, and another from Frant steeple, distant 30,949 feet; and its elevated and commanding view towards the coast of France, induced general Roy to point this out (Phil. Transf. 1790, p. 266.), as a proper spot for an English astronomer, with a well regulated clock and instruments, to be stationed, for making corresponding observations, with a French astronomer, stationed 100 miles, or more distant, on the Chalk hill, near Helfaut in France, on the instantaneous explosions of lights to be repeatedly fired, near Folkestone turnpike in England, and at Montlambert or at Fienne windmill in France, for the purpose of determining the difference of longitude of these English and French observatories, as a check on that deduced from angular measurements, or the **CONVERGENCY of Meridians**; which see.

CROWD, in *Agriculture*, a term frequently used provincially to signify the wheeling any thing in a barrow. Thus "to crowd," implies to wheel in a barrow.

CROWD, *to*, in *Sea Language*, is to carry an extraordinary force of sail on a ship, in order to accelerate her course on some important occasion.

CROWDING-BARROW, a name sometimes applied to a wheel-barrow.

CROWEA, in *Botany*, a genus of New Holland plants, (named in honour of James Crowe, esq. F.L.S., of Lakenham, near Norwich, who died Jan. 26, 1807, aged 56. This gentleman was extremely well versed in the botany of Britain, more especially in the genus *Salix*, to which he had paid particular attention, having collected and cultivated all the species he could possibly procure. Many of his remarks have appeared in Dr. Smith's *Flora Britannica*, and *English Botany*, tending to the economical as well as botanical illustration of this difficult and important genus, of which about four times more British species are now known than have appeared in any preceding writer upon them. The specific name of the original species, *Crowea Saligna*, alludes to Mr. Crowe's merits in this department. His botanical knowledge was applied no less happily to agricultural purposes on many occasions, and he excelled also in the study of Mosses, Lichens, and Fungi. *Sm. Tr. of Linn. Soc. v.*

4. 222. Class and order, *decandria monogynia*. Nat. Ord. *Rutaceae*, Juss. Vent.

Gen. Ch. *Cal.* of 5 leaves, cohering by their tapering bases round a stalk which elevates the rest of the flower, according to M. Ventenat's remark. *Cor.* Petals 5, regular, equal, ovate, spreading, inserted under a glandular nectary, which furrounds the base of the germen. *Stam.* Filaments 10, about half as long as the petals, awl-shaped, flat, fringed with dense hairs, by which they are matted together, by their lower half, into a tube; 5 alternate ones are rather shorter than the rest; anthers sessile about the middle of each filament, on the inside, oblong, of 2 cells, bursting longitudinally, and destitute of any erect gland, or appendage. *Pyl.* Germen of 5 lobes, smooth, somewhat depressed; style central, from the base of the germen: stigma capitate. *Peric.* Capsules 5, connected by their base, oval, slightly compressed, coriaceous, of 2 valves, enclosing an elastic, cartilaginous, bivalve arillus. *Seeds* solitary, kidney-shaped, brown.

Ess. Ch. Calyx of 5 leaves. Petals 5, sessile. Stamens flat, awl-shaped, connected by entangled hairs. Anthers fixed longitudinally to the inside of each filament. Style from the base of the germen. Capsules 5, combined. Seeds enclosed in an arillus. M. Ventenat, who first detected the singular structure and insertion of the base of the calyx-leaves, wishes to found the generic character on that circumstance, but the analogy of this natural order proves the anthers to afford the most essential difference. See *CORRÆA*, which belongs to the same order; also *BORONIA*, *Sm. Tracts on Nat. Hist. t. 4—7.*

Sp. 1. *C. saligna*. Willow-leaved Crowea. *Andr. Repos. t. 79. Vent. Jard. de la Malmaison, t. 7.* Leaves lanceolate, entire. Angles of the branches smooth. This beautiful shrub is about 3 feet high, branched; the branches angular, leafy, smooth. *Leaves* alternate, sessile, lanceolate, entire, tipped with a small point, smooth on both sides, and marked with a longitudinal rib. *Stipulas* none. *Flowers* axillary, solitary, on short simple smooth stalks, with two or three minute bractæas. Their colour is a fine pink, and the woolly tips of the stamens form an elegant pale tuft in the centre. A native of New South Wales, near Port Jackson, from whence it was first sent by John White, M.D. It thrives in a greenhouse, in light peat earth, flowering in autumn, but is rather tender, and will not bear much wet. The whole plant is aromatic when bruised, but less strongly scented than many of its natural order. It is propagated either by seeds or cuttings.

2. *C. angustifolia*. Narrow-leaved Crowea. Leaves linear, minutely toothed. Angles of the branches rough. More slender than the last, and distinguished by the rough or denticulated angles of the branches. *Leaves* very narrow, linear, obtuse, most distinctly toothed towards their extremity, pale-coloured beneath. *Flowers* about half the size of the foregoing, with the extremities of their filaments paler, and less woolly. *Style* hairy, about as long as the stamens. Found by Mr. Menzies, near King George's Sound, on the west coast of New Holland. It is as yet a stranger to our gardens.

It must be observed that the specific characters of *C. saligna* to be seen in the writers above quoted, were made without any knowledge of this second species. Such characters can by accident only have any meaning, a specific difference for a solitary species being evidently a most glaring absurdity. S.

CROWLAND, or **CROYLAND**, in *Geography*, an ancient town in Lincolnshire, England, is situated on an island, in a great fen, or level, watered by the Welland, the Washes, the

the Nyne, and the Shire drain. The wet soil of the neighbourhood formerly rendered the town almost inaccessible, and for a long time the only approach was on the N.E. side. Such were the difficulties and delays attending the passage of this dangerous road, that it produced the adage of "All the carts that come to Crowland are shod with silver." The inhabitants have since made a good causeway, a turnpike road, and numerous drains, which have converted many of their fens into corn-fields, and greatly improved the state of the air. The houses of the three streets are built on piles, the water-courses that separate them are adorned on each side by willows, and the communication is preserved by a most singular triangular bridge, the three sides of which, after an ascent too steep for carriages, meet, and form a curious pointed arch. Carriages, &c. pass under this bridge, where the Nyne, Welland, and Cattwater join, and form one stream, flowing hence through Spalding to the sea. This half-useless structure stands on the site of one mentioned in a charter granted by king Edred to the monks of Crowland, in 943; the date of the present bridge is not noticed by historians, but the outline is a convincing proof that the original bridge has long since perished; on the angle which communicates with the London road, is a statue said to be of Ethelbald king of Mercia, in a crown fleury, and with a globe in his right hand. Ethelbald is said to have founded the magnificent abbey at Crowland about the year 716, in consequence of a vow made before he ascended the throne. It was dedicated to the Virgin Mary, St. Bartholomew, and Guthlake, his confessor, and endowed with the isle of Crowland, released for ever from all secular payments; the charter granted to the abbot and brethren on this occasion, was exhibited to the Society of Antiquaries in 1734, by Robert Hunter, esq. then possessor of the site of the monastery. The Danes burnt the abbey in 870, and the monks were reduced by misfortunes to five, in 941, when Turketyl, brother to Edred, and chancellor in the reign of king Edmund, restored them to their pristine state, and Edred rebuilt the abbey in 948. A second conflagration, which occurred during the abbacy of Ingulphus, in the year 1091, deprived the monks of 700 volumes, containing the most valuable literature of the preceding time; after this event the monastery gradually recovered from its disasters, and flourished with great splendour till the dissolution, when the revenues amounted to 1083*l.* 15*s.* 10*d.* The inhabitants of Crowland paid a considerable sum annually to the abbots for the right of fishing in their neighbourhood; but their principal profits have for a very long time originated from their superior dexterity in decoying, and taking wild ducks in astonishing numbers. (See DUCK.) The ruins of the abbey are extremely interesting at present; they are richly adorned with sculpture; the foundations rest on piles, and some part of the remains is fitted up as the parish church. Crowland has a small weekly market on Saturday, and is 93 miles north of London. Howlet's Views in Lincolnshire, 410.

CROWLE, a town of England, in the county of Lincoln, with a weekly market on Saturday; 36 miles N. of Lincoln, and 169 N. of London.

CROWN, *Corona*, a mark of regal dignity; being an ornament worn on the head by kings and sovereigns, as a symbol of their authority.

Gallet derives the word *corona*, whence *crown*, from the Latin *cornu*, *horn*; because the ancient crowns were pointed in manner of horns; which were anciently, both by Jews and Gentiles, esteemed as marks of power, strength, authority, and empire. Hence, in the holy scripture, horns are used for the regal dignity; and accordingly *horn* and *crown*, in the Hebrew, are expressed by the same word.

In the remotest antiquity, the crown was only given to gods. Pliny says, that Bacchus was the first who used it. Pherecydes, cited by Tertullian, De Corona, says Saturn, Diodorus ascribes it to Jupiter after his victory over the Titans. Q. Fabius Pictor attributes the invention to Janus, adding, that it was an ornament he used in sacrificing. Leo the Egyptian says, it was Isis who first wore a crown; and that it consisted of ears of corn, the use whereof the first taught men.

In this most authors agree, that the crown originally was rather a religious than a civil ornament; rather one of the pontificalia, than the regalia; that it only became common to kings, as the ancient kings were priests as well as princes; and that the modern princes are entitled to it, in their ecclesiastical capacity rather than their temporal. See KING, &c.

The first crowns were no more than a bandelet, or headband, drawn round the head, and tied behind, as we still see it represented on medals, around the heads of Jupiter, the Ptolemies, and the kings of Syria.

Afterwards they consisted of two bandelets; by degrees they took branches of trees of divers kinds; at length they added flowers; inasmuch that Tertullian, De Corona, assures us, (from Claudius Saturninus, who had written expressly on the subject,) there was not any plant whereof crowns had not been made.

The woods and groves were searched, to find different crowns for the several deities; thus on medals, we find Jupiter's crown of flowers, more frequently of laurel; Juno's of the vine; that of Bacchus, the vine with grapes, vine-leaves, and branches of ivy, with flowers and berries; those of Castor, Pollux, and the river-gods, of bulrushes; that of Apollo, sometimes of laurel, sometimes of rushes; that of Saturn, new figs; that of Hercules, poplar; that of Pan, pine or alder; that of Lucina, dittany; that of Horæ, the fruits proper to each season; that of the Graces, olive-branches, as well as that of Minerva; that of Venus, roses; of Ceres, ears of corn, as well as that of Isis; that of the Lares, myrtle or rosemary, &c.

Crowns were not only used on the statues and images of the gods, by the priests in sacrificing, and by kings and emperors, but also on altars, temples, doors of houses, sacred vessels, victims, ships, &c.

The *agonothetæ* crowned those who were victors in the solemn games, warriors, &c.

Among the Romans there were various kinds of crowns, distributed as rewards of military achievements. The *oval* crown was the first, made of myrtle, and was bestowed on generals who had been victorious over slaves, or enemies unworthy of the Roman valour, and who were entitled to the honours of the lesser triumph, called *ovation*.

The second was the *naval* or *rostral* crown, consisting of a circle of gold richly chased: having on the edge four masts of ships, and as many heads of ships placed alternately; given to the captain who first grappled, or the soldier who first jumped aboard an enemy's ship.

— Cui belli insigne superbum

Tempora navali fulgent rostrata corona."

Virg. Æn. viii. v. 684.

Lipsius supposes the *navalis* and *rostrata* to have been two distinct species of crowns; but it is generally believed that they were the same kind of crown.

The third, called *vallaris*, or *castrensis*, was also a circle of gold, raised with pointed piles or palisades; given to him who first leaped into the enemy's camp, or forced the palisades or entrenchments.

The fourth, called *mural* crown, was a circle of gold, indented

dented or embattled, thus bearing some allusion to the figure of a wall; given to him who first mounted the wall of a place besieged, and there lodged a standard; this crown we also find given, on medals, to the particular genii and guardians of provinces and places.

The fifth, the *civic* crown, made of a branch of green oak; given to him who had saved the life of a citizen in a battle or assault. This was conferred on Cicero for detecting Cataline's conspiracy, and afterwards on Augustus Cæsar himself.

This was reckoned more honourable than any other crown, though composed of no better materials than oak boughs. Virgil (*Æn.* vi. v. 772.) calls it "*civilis quercus*:"

"Atque umbrata gerunt civili tempora quercu."

Plutarch (in Coriolan.) suggests, the reason why the branches of this tree should be made use of in preference to all others. For the oak wreath, says he, being otherwise sacred to Jupiter, the great guardian of their city, the Romans might, therefore, think it the most proper ornament for him who had preserved a citizen. Besides, the oak may very well claim the preference in this case, because, in the primitive times, that tree alone was thought almost sufficient for the preservation of a man's life; its acorns were the principal diet of mankind in the more early ages, and the honey, which was commonly found there, presented them with a very pleasant liquor. It was a particular honour conferred on the persons who had merited this crown, that, when they came to any of the public shows, the whole company, as well senate as people, should signify their respect, by rising up when they saw them enter; and that on these occasions they should take their seats among the senators, being also excused from all troublesome duties and services, in their own persons, and procuring the same immunity for their father, and grandfather by his side. (*Plin.* l. xvi. c. 4.)

The sixth was the *triumphal* crown, made of branches of laurel, or bay-tree, given to a general who had gained a battle, or conquered a province, and who was worthy of the honour of a triumph. This was afterwards made of gold; and not restrained only to those who actually triumphed, but presented on several other accounts, as commonly by the foreign states and princes to their patrons and benefactors.

The seventh, the *corona obsidionalis*, or graminea, made of grass or herbs found on the ground in the place besieged; given by common consent of the soldiers to generals who had delivered a Roman army besieged by the enemy, and obliged him to decamp. Besides these, we meet with the *corona aurea*, often bestowed on soldiers without any other additional term. Dion Cassius mentions a particular sort of coronet made with olive-boughs, and bestowed, like the rest, in consideration of some signal act of valour. Lipsius is of opinion that these succeeded the golden crowns when the latter were laid aside.

The eighth was also a crown of laurel, given by the Greeks to their athletes; and by the Romans to those who had negotiated, or confirmed a peace with an enemy; this was the least esteemed. Besides these, in antiquity, we meet with *radial* crowns, given to princes at their translation among the gods, whether before or after their death. Casaubon says, this sort of crown was peculiar to deities; yet it is certain Nero took it in his lifetime.

Athletic crowns were destined to crown victors at the public games.

Of these the *Olympic chaplet*, or *crown*, composed of the branches of a wild olive, and conferred on the conquerors in the Olympic games, merits particular notice. In order to enhance the value of these olive chaplets, and to render them

in some degree worthy of these games, which by way of eminence were styled *boly*, the Eleans pretended that the tree, from which they were always taken, was originally brought to Olympia by Hercules, from the country of the Hyperboreans; a people, whose situation no geographer, ancient or modern, has yet been able to determine. Pindar ascribes the honour of this exploit to Hercules, the son of Alcmæna, though others, as Pausanias informs us, gave it to the Idæan Hercules, who was earlier by some generations. The Eleans further pretended that this particular tree was selected and indicated to them, among many others of the same kind, by the Delphic oracle. For this purpose, as the fact is related in a fragment of Pælegon, they sent Iphitus, their king, after he had restored these games (for during the first five Olympiads, as this writer says, no one was crowned) to Delphi, to whom the god gave this answer, as we have it in West's Dissertation:

"To the swift victor be no more assign'd
The bleating offspring of the fleecy kind.
But from the olive, which spontaneous grows
In Pisa's vale, a verdant crown compose;
That olive, round whose venerable head
Her subtle textures hath Arachne spread."

Iphitus, upon his return to Olympia, having discovered, among the many wild olives that grew in the sacred grove, one which was covered with cob-webs, enclosed it with a wall; and from this tree was a chaplet or crown taken, and given to the conquerors. The first who was crowned was Daicles of Messene, who, in the seventh Olympiad, gained the victory in the stadium, or simple foot-race.

From this account we also learn, that the prize originally bestowed upon the Olympic conquerors was a lamb. Some have suggested, but erroneously, in Mr. West's opinion, that in some periods of these games, the crowns given to the victors were of gold. The Eleans, it is conjectured, substituted the cheaper one of an olive crown; and in order to sanction this change, and to give a lustre to their olive chaplet, they had recourse to fables, and to the authority of a Delphic oracle. With the same view they not only encompassed this sacred olive with a wall, and distinguished it by the name of "*Callistephanos*," *i. e.* the tree of the crowns of glory; but put it also under the protection of certain nymphs or inferior deities, whom from their office they called "*Callistephani*," and to whom they erected an altar near that consecrated plant. These crowns, for the purpose of exciting the emulation of competitors, were placed in their view, upon a tripod, or table, which, during the games, was placed in the middle of the stadium, or of the hippodrome, as the respective exercises required. In the interval of the games, they were kept, the former in the temple of Jupiter, the latter in the temple of Juno, at Olympia. The tripod was of brass, and seems to have been entirely laid aside after the table was made, which was composed of gold and ivory, the workmanship of Colotes of Paros, a disciple of Pafiteles. Branches of palm were exhibited on the same table, and conferred on the victors, with the crowns; these palm branches they carried in their hands, as emblems, says Plutarch, of the unsuppressive vigour of their minds and bodies, manifested in gaining the victory over their antagonists. The conquerors were summoned by proclamation to receive these tokens of victory; and accordingly they marched in order to the tribunal of the Hellanodics, where a herald, taking the crown of olive from the table, placed one upon the head of each of the conquerors; and giving into their hands branches of palm, led them in that equipage along the stadium, preceded by trumpets, proclaiming at the same time with a loud voice, their names, the name of their fathers, and their countries;

tries; and specifying the particular exercise in which each of them had gained the victory. Mr. West conjectures, that although the Olympic crowns were all composed of the branches of the sacred olive, they were distinguished from each other, either by the difference of their form, or the addition of some emblematic ornament peculiar to the several exercises. The racer's crown was different from the wrestler's, and so of all the rest. This conjecture, he conceives, is countenanced by a passage of Plutarch (*De Tranquil. Animi*), who seems to distinguish between these two last-mentioned crowns. This ingenious writer further suggests, that, besides the chaplet peculiar to the games, the conquerors in general received another composed of wings or plumes. That different degrees of merit were rewarded with different degrees of honour, and consequently with different crowns, Mr. West infers from the words of St. Basil (*Ap. Fab. Agon. l. iii. c. 1.*); "No president of the game," says he, "is so devoid of judgment, as to think a man, who, for want of an adversary, hath not contended, deserves the same crown (*ἰσὺν στεφάνῳ*) as one, who hath contended and overcome." Although he received a crown, yet it was different from that which he would have received if he had contended and vanquished. Before the victors at the Olympic games were put in possession of their crowns, they were saluted by the acclamations and applauses of the numerous assembly; by the warm congratulations of their friends, and even the faint and extorted greetings of their maligners and opposers. As they passed along the stadium, after having received their crowns from the Hellenodice, they were again saluted with the acclamations of the spectators, accompanied with a shower of herbs and flowers, poured on them from every side. It was also customary for the friends of the conquerors to express their particular respect to them, by accosting them and presenting them with chaplets of herbs, &c. binding their heads with fillets, ribbons, &c. West's Dissertation on the Olympic Games. See *OLYMPIC Games*.

The custom of *crowning* persons who had distinguished themselves in poetry and music, which was almost as ancient as the arts themselves, subsisted till the reign of Theodosius, when the *CAPITOLINE games*, being regarded as remnants of Pagan superstition, were utterly abolished. About the time of Petrarch, however, poetry recovered its ancient lustre and importance, or was invested with its former prerogatives. In the year 1340, Petrarch had the honour of receiving on the same day two letters, one from the senate of Rome and another from the university of Paris, inviting him to accept the laurel crown; and in the following year he was magnificently crowned at Rome. "The crown," said the senator who placed it on his head, "is the meed of virtue." Being conducted in great pomp, after the ceremony, to the church of St. Peter, he returned thanks to God for the honour that had been bestowed upon him, and then laid down his crown, that it might be placed among the offerings that were suspended to the roof of the temple. See *PETRARCH* and *LAUREAT*.

From some passages in Eusebius Cæsariensis, some authors conclude, that bishops had likewise anciently their crowns.

The Roman emperors had four kinds of crowns, still seen on medals, *viz.* a crown of laurel, a radiating crown, a crown adorned with pearls and precious stones, and the fourth a kind of bonnet, or cap, something like the mortier.

The first was ordinarily that used from the time of Julius Cæsar: the right of bearing it was granted him by the senate; some say on account of his baldness; and afterwards

continued to his successors. Justinian was the first who took that of the bonnet-kind.

The *papal crown* is composed of a cap or tiara, enclosed by three marquises coronets, having two pendants, like the bishops' mitres; and on its top a mound of gold; these three crowns represent the pretended triple capacity of the pope, *viz.* as high-priest, supreme judge, and sole legislator of the Christians.

Royal crowns were anciently open, but are now more or less closed at their tops with arches, and are called "imperial crowns."

The *imperial crown* is a bonnet or tiara, voided at the top like a crescent, with a circle of gold, adorned with precious stones and pearls, heightened with fleurs-de-lis, supporting a globe, with a cross at the top.

The *English crown* is adorned with four crosses, in the manner of those of Malta; between which are fleurs-de-lis. It is covered with four diadems, which meet at a little globe supporting a cross.

According to Selden, the kings of the Saxon race in England had a crown, like that of other nations, which at that time was only a plain fillet of gold; but king Egbert first fixed on the circle or fillet, with points or rays, resembling the crown worn by the emperors of the East; and king Edward, surnamed Ironside, topped the points with pearl. William the Conqueror is said to have had his circle flowery; but Sandford says, the coronet had on the circle points and leaves, the points being much higher than the leaves, and each of them topped with three pearls, and the cap or tiara topped with a cross patteé, as appears on the seal of that monarch. The crown worn by his son, William Rufus, was only enriched with points, pearled at their tops, and not accompanied with flowers. The crown of Henry I. is adorned with fleurs-de-lis only, a little raised, as is seen on his great seal and coin. Maud, queen of England, had her crown enriched with leaves and points, the leaves or flowers being higher than the points; and their successors to king Edward III. had their crowns variously enriched with points and fleurs-de-lis placed alternately, sometimes the one higher than the other. King Edward III. enriched his crowns with fleurs-de-lis and crosses patteé. Edward IV. had a close or arched crown, heightened with fleurs-de-lis and crosses patteé, and arched with four bars. Edward V. and Richard III. bore the same as king Edward IV. Henry VII. and VIII. had their crowns composed of fleurs-de-lis and crosses patteé, with two arches, embellished with pearls, &c.; and this form has been since continued. The *crown of England*, with which the kings of England are crowned, is called "St. Edward's Crown," made in imitation of the ancient crown said to be worn by that monarch, kept in the abbey church of Westminster till the beginning of the civil wars in England, when, with the rest of the regalia, it was stolen and sold in 1642. This very rich imperial crown of gold was made against the coronation of Charles II., and is embellished with pearls and precious stones, as diamonds, rubies, emeralds, and sapphires, and has a mound of gold on the top, enriched with a fillet of gold, embellished also with precious stones. Upon the mound is a cross of gold, embellished with precious stones, and three very large oval pearls, one fixed on the top, and two others pendant at the ends of the cross. It is composed, as all the imperial crowns of England are, of four crosses patteé, and as many fleurs-de-lis of gold, placed on a rim or circle of gold, all embellished with precious stones. From these crosses arise four circular bars or arches, which meet at the top in form of a cross; having at their intersection

tion a pedestal, on which is fixed the mound already mentioned. The cap within this crown is of purple velvet, lined with white taffeta, and turned up with ermine. This continues invariably the same for the purpose of coronation; but the jewels and precious stones are taken out of the crown of state, fixed in collets, and pinned into this crown; and when the coronation is over, they are taken out, and in their room are substituted mock stones to represent the real ones. The *crown of state*, so called because it is worn by the king whenever he comes in state to the parliament, was made instead of another, which was sold and destroyed in 1642, against the coronation of king Charles II., and worn only by that king in his return from the abbey to Westminster-hall. Since that time there is a very rich crown, embellished with diamonds, made for every succeeding king or sovereign queen, to wear for that day only at the coronation dinner in Westminster-hall. This is very rich, being embellished with several large diamonds, and a great quantity of pearl; but it is most distinguished by a very large ruby, set in the middle of one of the four crosses, and estimated at the value of 10,000*l.*, and also by the mound's being one entire stone of a sea-water green colour, known by the name of an "agmarine." The cap is of purple velvet, lined and turned up like the former. The *queen's circlet of gold*, worn by her majesty in proceeding to her coronation, is richly adorned with large diamonds, with a string of pearl round its upper edge. The cap is purple velvet, lined with white taffeta, and turned up with ermine richly powdered.

The *queen's crown*, with which every queen consort is crowned, was made for Catharine, queen of king Charles II., and originally called "St. Egitha's crown," in commemoration of Egitha, queen consort of king Edward the Confessor. It is a rich imperial crown of gold, set with very valuable diamonds, intermixed with other precious stones and pearls. It is composed of crosses and fleurs-de-lis, with bars or arches, and a mound and cross on the top of the arches, like the crown of St. Edward, only smaller and lighter. The cap is of purple velvet, lined with rich white taffeta, and turned up with ermine, or meniver pure, richly powdered. The crown of St. Edward is solely appropriated to the coronation of a sovereign queen; being never used for crowning a queen-consort.

The *imperial crown* of Scotland was, at the time of the union between England and Scotland, deposited in the crown room within the castle of Edinburgh, A. D. 1707. 6 Anne.

The *French crown* was a circle of gold, enamelled, of eight fleurs-de-lis, encompassed with eight arched diadems: bearing a-top a double fleur-de-lis, which is the crest of France.

The *Spanish crown* was a circle of gold, adorned with jewels and precious stones, and ornamented with eight leaves, but not closed with arches until the marriage of Philip II. of Spain with queen Mary of England: since that time it hath continued arched, with this difference, that it hath two more arches than the crown of England. Those of Bohemia, Poland, Denmark, and Sweden, are of the same form, ornamented with eight leaves, and closed like that of Spain.

The crowns of most other kings are circles of gold, adorned with precious stones, and heightened up with large trefails, and closed by four, six, or eight diadems, supporting a mound, surmounted with a cross. The crowns of France, Spain, and other foreign kingdoms, have no caps within them; neither have they any ermine, like the crowns of England. The *crown* of the grand duke of Tuscany still

remains open, and differs in its form from all others. It was placed on the head of Cosmus de Medicis by pope Pius V, when he honoured him with the title of grand duke of Tuscany in 1570.

The *crown* of Hungary is the same with that of France, Spain, &c.; but over it is another crown, composed of 16 plates of gold, from which arise two arches, having in their centre a cross, the ends of which are ornamented with large pearls: the plates are enamelled with busts of Jesus Christ and his apostles, as is also the flat part of the arches, and enriched with pearls, jewels, and precious stones. A fabulous tradition says, that this crown dropped from heaven, for the crowning of Stephen the first king of Hungary, in the year 1000.

The great Turk bears over his arms a turband, enriched with pearls and diamonds, under two coronets, the first of which is made of pyramidal points, heightened up with large pearls, and the uppermost is surrounded with crescents.

The *electoral crown*, or *coronet*, or *crozier* of Charlemagne, is a scarlet cap, turned up with ermine, and closed with a semi-circle of gold, all covered with pearls. On the top of it there is a globe with a cross thereon. It is borne by his majesty the king of England, on an escutcheon, in the fourth quarter of the royal achievement, as arch-treasurer of the sacred Roman empire.

CROWNS, or Coronets, of British princes of the blood royal. 1. The *crown* of the prince of Wales is a circle of gold, set round with four crosses-pattée, and as many fleurs-de-lis alternately; from the two centre crosses-pattée is an arch, adorned with pearls; in the middle of which is a ball and cross; and within the coronet is a crimson cap, lined with white farset, and turned up with ermine. Besides this, the prince of Wales has another distinguishing mark of honour, viz. a plume of three ostrich feathers, with an ancient coronet of a prince of Wales, with this motto, *Ich dien, i. e. I serve*. This device was at first taken by Edward prince of Wales, commonly called the Black Prince, after the battle of Cressly, A. D. 1346, where, having killed John king of Bohemia, he took from his head such a plume, and put it on his own. 2. The *coronet* of the princes of the blood royal is composed of a circle of gold, richly chased; on the rim or edge two crosses pattée, two strawberry leaves, and four fleurs-de-lis: within the coronet is a crimson velvet cap, lined with farset, and turned up with ermine: on the top of the cap, a rich tassel of gold and spangles.

CROWNS, or Coronets, of the British nobility. 1. That of a duke is a circle of gold richly chased; having on the edge eight strawberry leaves of equal height: a crimson velvet cap topped by a tassel of gold, and turned up with ermine of one row. 2. That of a marquis is a circle of gold, set round with four strawberry-leaves, and as many pearls, on pyramidal points of equal height, alternately: the cap, &c. as before. 3. An earl's has eight pyramidal points, with as many large pearls on the tops of them, placed alternately, with as many strawberry-leaves, lower than the pearls: the cap and tassel as before. Coronets were first assigned to earls in the reign of Henry III. 4. The viscount has only pearls, without any limited number, placed on the circle itself, all round: cap, &c. as before. Coronets were first assigned to viscounts in the reign of king James I. 5. A baron has only six pearls, set at equal distance, on the golden border of ermine; not raised, to distinguish him from the earl; and limited, to shew that he is inferior to the viscount.

The barons originally wore only a crimson cap turned up with

with white fur; but by a grant, dated August 7, in the 13th year of Charles II., they obtained the privilege of wearing coronets according to their respective dignities: and in 1665, king Charles II. granted his royal warrants to the officers of arms in Scotland and Ireland, for the peers of each of these kingdoms to wear the same fashioned coronets with those of England, according to their several degrees. These coronets consist of a circlet of gold, with six pearls only on the rim, a cap, tassel, &c. No peer or peeress, under the dignity of princes and princesses of the blood royal, ought to have the circle or rim of their coronet enriched with either precious stones or jewels, or embellished with any pearls, except those mentioned to encompass the coronet of the baron, viscount, earl, and marquis; but this rule is now so little regarded by herald painters, that the coronets on the carriages of many of the peers and peeresses are represented as having their arms studded, and ornamented with pearls, precious stones, &c. The balls on the English coronets are commonly called pearls; but they are always made of silver.

The eldest sons of peers, above the degree of a baron, use the coronet appertaining to the father's second title; and none of the younger sons use coronets.

The coronet of the kings of arms is a plain circle of gold, bearing sixteen leaves, eight of which are higher than the others; on the bands are engraved the following words, "Misere mei Deus."

The arms of the archbishopric of Canterbury are borne by the present archbishop, as they have likewise been borne by some of his predecessors, timbered with a mitre affronté, encircled by a ducal coronet, and with two labels or pendants fixed to it, hanging waved and folded on each side of the shield. As for the coronets belonging to the late titled dignities of France, it is now needless to recount them. See the Plates of crowns and coronets under the title Heraldry.

Ch. Paschal has wrote expressly de Coronis. Baudelot, in his History of Ptolemy Auletes, has a number of curious observations on the same subject, that had escaped Paschal. Du-Cange gives us a curious dissertation on crowns; and Schmeizell, a German, a treatise of royal crowns, both ancient and modern.

CROWN, in Architecture, denotes the uppermost member of the cornice; called also corona and larmier.

CROWN, in Astronomy, is a name given to two constellations; the one called septentrionalis, and the other meridionalis. See CORONA.

CROWN of an Arch, among Bricklayers, signifies the top or part denominated the key-stones among stone-masons. See HAUNCH and SPANDRIL.

CROWN, in Commerce, is a general name for coins both foreign and domestic, of or near the value of five shillings sterling.

In its limited sense, crown is only applicable to that popular English coin which bears the name, and which is equivalent to five shillings, or sixty English pence; or to six livres French money. According to the statute, these consist of 111 parts of silver and 9 of copper in 120, or $\frac{111}{120}$ the fine, as the assayers term it: the weight is $\frac{1}{17.34}$ of a pound troy = 464.5161 English grains = .066359 lb. avoirdupoise. But, in its extensive sense, it takes in several other coins; as the French ecu, which we call the French crown, struck in 1641 for sixty sols, or three livres; also the patagon, dollar, ducatoon, six-dollar, and piastre, or piece of eight.

CROWN, in an Ecclesiastical Sense, is used for the clerical

tonsure; which is the mark or character of the Romish ecclesiastics.

This is a little circle of hair, shaved off from the crown of the head; more or less broad, according to the quality of the orders received. That of a mere clerk is the smallest; that of priests and monks the largest.

The clerical crown was anciently a round list of hair, shaved off around the head, representing a real crown: this is easily observable in several ancient statues, &c. The religious of St. Dominic and St. Francis still retain it.

CROWN of the Virgin. See ROSARY.

CROWN, in Geometry, a plane ring included between two parallel or concentric peripheries, of unequal circles; generated by the motion of some part of a right line round a centre, the moving part not being contiguous to the centre.

The area of this is had, by multiplying its breadth by the length of a middle periphery, which is a mean proportional between the two peripheries that bound it.

Let D be the middle point of the breadth AB (Plate II. Analysis, fig. 23.); let CB = a, and CA = r. Let the circumference of the outer circle be c, and its area will be $\frac{ca}{2}$, and the area of the inner circle will be $\frac{cr^2}{2a}$, this

quantity being a fourth proportional to a^2 , r^2 , and $\frac{ca}{2}$; then the difference of these two areas, or the area of the crown, will be $\frac{ca}{2} - \frac{cr^2}{2a} = \frac{c}{2} \times \frac{a+r}{a}$: but $a-r$

is equal to AB, the breadth of the crown, and $\frac{c}{2} \times \frac{a+r}{a}$ is the circumference of the circle, whose radius is CD; because CD is an arithmetic mean between CA and CB, and therefore equal to $\frac{r+a}{2}$, and the circumfer-

ences of circles are as their radii, or $a : c :: \frac{r+a}{2} : \frac{c}{2} \times \frac{a+r}{a}$.

CROWN, or Coronet, in Heraldry, is used for the representation of that ornament, in the mantling of an armoury; to express the dignity of the person who bears it.

The crown here is of more antiquity even than the helmet; and it was used as a symbol of victory and triumph. See CROWN supra.

CROWN, among Jewellers, the upper work of the rose diamond, which all centres in the point at the top, and is bounded by the horizontal ribs.

CROWNS, pearled, or flowered, those with pearls, or leaves of smalage, parsley, &c. Such were anciently almost all crowns, even those of sovereign princes: though they were not used in their armours, till about two hundred years ago. See CROWN supra.

CROWNS, radiated, or pointed, are those of the ancient emperors, which had twelve points; representing, as some will have it, the twelve months of the year.

CROWN Royal, Order of, an order of knighthood, which, some say, was instituted in 802; the knights of which bore a crown embroidered with gold, on a white robe. Others deny the existence of such an order.

CROWN of Colours, in Meteorology, certain coloured rings, which, like halos, appear about the body of the sun and moon, but of the colours of the rainbow; and at a less distance than the common halos. These crowns sir Isaac

Newton shews to be made by the sun's shining in a fair day, or the moon in a clear night, through a thin cloud of globules of water or hail, all of the same bigness; and according as these globules are bigger or less, the diameter of these crowns will be larger or smaller; and the more equal these globules are to each other, the more crowns of colours will appear; and the colour will be the more lively. See *CORONA* and *HALO*.

CROWN of the Cable, in *Sea Language*, denotes the bights which are formed by its several turns.

CROWN, in *Music*, a rest marked by a reversed C, with a point in the middle of it, thus ☞

CROWN, Clerk of the. See *CLERK*.

CROWN, Pleas of the. See *PLEA*.

CROWN, Officers of the. See *OFFICER*.

CROWNS, Thundering, in *Military Language*. These are two, three, or four circles tied together with a thread of wire, round which they fasten grenades, pistol barrels, charges, &c. They cover the whole with hairs of hemp or tow, and combustible materials. Setting fire to these circles, they roll them upon the works of the besiegers. They are also made use of for repelling attempts to mount the breaches, when they are peculiarly called *thundering crowns*. In other cases, they are commonly called *circles a feux*.

CROWN-Glass, denotes the finest sort of window-glass. See *GLASS*.

CROWN-Grafting. See *ENGRAFTING*.

CROWN Imperial, in *Botany*. See *FRITILLARIA Imperialis*.

CROWN Imperial, in *Gardening*, is a well-known plant of the flowering kind, of which different species are cultivated in flower-gardens for their great elegance when in blow: and there are likewise, annually, a great number of varieties produced from the seeds of each of these distinct species, which, when intermixed in the different compartments, afford not only an extremely pleasing but interesting appearance, to those who are curious in flowers. The modes of culture and management will be described under the proper head. See *FRITILLARIA*.

CROWN Imperial Shell, in *Conchyliology*. See *VOLUTA*.

CROWN-Office, a court or office under the king's-bench, of which the king's coroner or attorney there is commonly matter; so called, because the crown is more immediately concerned in what is therein transacted. See *COURT of King's-bench*. Though none of the officers under the lord chief-justice of the king's-bench are employed in summoning a parliament; yet many of them have business in other matters, during the sitting of the parliament: as in cases of error, &c. but more especially on trials of peers; wherein the clerk of the crown is chief manager. He has likewise, out of parliament, all indictments in the crown, informations, recognizances; and a multitude of other business runs through his hands, as the writings of all pleadings, declarations, and other proceedings upon records; but the executive part is left to his secondary or deputy. See *INFORMATION*.

CROWN-Post, in *Architecture*, a post which in some buildings stands upright in the middle, between two principal rafters; and from which there go struts or braces to the middle of each rafter. It is otherwise called a *king's-piece*, or *joggle-piece*. See *POST*.

CROWN-Scab, in *Veterinary*, a disease in horses, consisting in a humour that breaks out round the coronet, of a sharp itching nature, and attended with scurfiness. The best remedy for this disorder is a mixture of equal parts of marsh-

mallow ointment, and yellow basilicon, spread on tow, and laid round the coronet.

CROWN Island, in *Geography*, an island in the Eastern Sea, near the N.E. coast of New Guinea. S. lat. 5° 18'. E. long. 141° 50'.

CROWN-Point, a township of North America, the most southerly of Clinton county in the state of New York; so called from the celebrated fortress which was in it, and which was garrisoned by British troops from the time of its reduction by general Amherst, in 1759, till the time of the American revolution. The point upon which it was erected by the French, in 1711, extends towards the north, into lake Champlain. After it was repaired by the British, it was the most regular and expensive of any constructed by them in America. The adjoining barracks, formed of stone, are capable of containing 2000 troops. It had also several outworks; but it is altogether in ruins, the walls of the barracks excepted, and the ditches on the south side, which were wide and deep, cut through immense rocks of limestone, and are still perfect. Before it was given up by the British, the powder magazine blew up, by which accident a great part of the works was destroyed; and since its evacuation, other parts have been demolished and ransacked in searching for bricks, lead, and iron shot. The view from this fort of old buildings overgrown with ivy, of the lakes, and of the distant mountains beyond it, is very fine. The fort, and 700 acres of good cleared land adjoining to it, are the property of the state of New York, and are leased out at the rate of about 33*l.* 10*s.* a-year, which is appropriated for the use of a college. *Crown-Point* is the most advantageous spot on the shores of lake Champlain for a military post, as it is not commanded by any rising grounds in the neighbourhood, which is the case with Ticonderago, the old fort and barracks of which are in ruins; and as the lake is so narrow here, owing to another point running out on the opposite side, that it would be absolutely impossible for a vessel to pass, without being exposed to the fire of the fort. The point opposite to *Crown-Point* is called *Chimney-Point*, on which are a few houses. The township of *Crown-Point* has no rivers; a few streams, however, issue from the mountains, which serve for mills and common uses. The mountains, which extend along the whole length of lake George, and part of lake Champlain, abound with moose deer, and the other inhabitants of the forest. In 1790, this township contained 203 inhabitants; and by the state census in 1795, it appears that there are 126 electors. The fortress lies in N. lat. 44° 26'. W. long. 73° 36'.

CROWN, Right of, Jus Coronæ, in *British History*, denotes the right of succession to the throne in these kingdoms. In this sense the crown, according to judge Blackstone, is by common law, and constitutional custom, hereditary, in a manner peculiar to itself; so that the right of inheritance may from time to time be changed, or limited, by act of parliament. The succession is such, that the next heir of the crown takes possession on the death or demise of the last proprietor; not by any *jure divino* title, but that kind of hereditary right which owes its origin solely to the founders of our constitution. The succession likewise resembles that of the heirs to landed estates, under particular exceptions: thus, the crown descends lineally to the issue of the reigning monarch, as from king John to Richard II., and to the first born of the male issue, as in the case of Edward V., who was preferred to Richard his younger brother, and Elizabeth his elder sister; but on failure of the male line, it descends to the female issue: thus Mary I. succeeded Edward VI., and the line of Margaret queen of Scots, the daughter

daughter of Henry VII., inherited on failure of the descendants of Henry VIII. Among the females, the crown descends to the eldest daughter and her issue, and not, like common inheritances, to all the daughters at once: thus queen Mary, on her brother's death, was the sole successor, though her sister Elizabeth was living. Moreover, the lineal descendants of any person deceased claim, as their ancestor would have done, if he had been still living. Thus, Richard II. succeeded his grandfather Edward III., in right of his father the Black Prince, to the exclusion of all his uncles. On failure of lineal descendants, the crown is vested in the next collateral relations of the late king, if they are lineally descended from the blood royal, as in the case of Henry I. who succeeded to William II., John to Richard I., and James I. to Elizabeth, being all derived from the Conqueror, who was then the only regal stock: nor is there any exception, as in common descents, to collateral relations of the *half-blood*. Thus Mary I. inherited after Edward VI., and Elizabeth after Mary, though born of Henry VIII. by different mothers.

However, this hereditary right is by no means indefeasible; because the immediate heir has been, and may be, excluded by the supreme legislative authority of this kingdom; to which it belongs to defeat this hereditary right, and by particular entails, limitations, and provisions, to exclude the immediate heir, and vest the inheritance in any one else. Under this controul, the crown naturally descends either to the *heres natus*, if the course of descent is unimpeded, or to the *heres factus*, in consequence of a particular settlement: because the king never dies, and there can be no *interregnum*.

Egbert, in the beginning of the ninth century, was the sole monarch of this kingdom; possessing the throne of the West Saxons by a long and undisturbed descent from his ancestors of above 300 years; and acquiring the other kingdoms of the heptarchy, some by conquest, but most of them by a voluntary submission. From Egbert, to the death of Edmund Ironside, through a succession of fifteen princes, the crown descended regularly, with very little deviation. In the three succeeding reigns, the succession was suspended by force; at length, upon the death of Hardicanute, the Saxon line was restored in Edward the Confessor, who indeed was not the next heir, because his brother Edmund Ironside had a son living, then an outlaw in Hungary. On his decease, without issue, Harold II. usurped the throne, though the right remained in Edgar Atheling, son of Edward the outlaw. At this time William the Norman invaded England, pretending a right to the crown from a grant of Edward the Confessor; and his conquest transferred the succession of the crown to a new family. (See CONQUEST.) From the Conqueror, as from a new stock, the race of Saxon kings being dropped for the present, it descended to his sons William II. and Henry I., the eldest son Robert being kept out of possession by his brethren. Henry was succeeded by Stephen of Blois, grandson of William I. by his daughter Adelicia, his elder brother Theobald waving his claim, and Matilda or Maud, the daughter of Henry I. and the grand daughter of Edward the outlaw, to whom the succession properly belonged, being excluded by force. However, her son Henry II., as heir to the Conqueror, succeeded Stephen, though the proper heirs in the Saxon line were the sons of Malcolm king of Scotland, by Margaret, the daughter of Edward the outlaw. From Henry II. the crown descended to his eldest son Richard I., and on his death was seized by his brother John, the youngest son of Henry, the right being vested in his nephew Arthur. On the death of Arthur,

and his sister Eleanor, without issue, the crown properly descended to Henry III. the son of John, and from him, in an hereditary line of six generations, to Richard II., and this right of succession was declared in parliament by stat. 25 Edw. III. s. 2. When Richard resigned the crown, as he had no children, the right reverted to the issue of his grandfather Edward III. and particularly to the posterity of Lionel, duke of Clarence; but Henry duke of Lancaster usurped the crown under the title of Henry IV., pretending to be a successor by right line of the blood royal. Parliament, by stat. 7 Henry IV. c. 2. settled the inheritance of the crown and kingdom in him and his heirs. He was regularly succeeded by his son and grandson, Henry V. and VI. In the last of these reigns the house of York began to assert their dormant title, and established it in the person of Edward IV. At his accession, the distinction of a king *de jure*, and a king *de facto*, first occurs; and by stat. 1 Ed. IV. c. 1. the three Henries are styled kings *in dolo*, and not of right. This king was succeeded by his eldest son Edward V., who was deposed by his unnatural uncle Richard III. under a pretence of bastardy. During the tyrannical reign of Richard, Henry VII., earl of Richmond, assumed the regal dignity, and his possession was established by parliament in the first year of his reign. He afterwards married Elizabeth of York, the undoubted heiress of the Conqueror, in whom the right of the crown was vested. Henry VIII. succeeded by indisputable hereditary right, and transmitted the crown to his three children in successive order; and stat. 25 Hen. VIII. cap. 12. provides for the regular succession in his descendants. This statute was repealed by 28 Hen. VIII. c. 7., by which Elizabeth and Mary were bastardized, after the king's divorce from Anne Boleyn. They were again legitimated, and the succession restored by 35 Henry VIII. c. 1. The right both of Mary and Elizabeth is again expressly recognized by parliament, after their respective accession; and parliament explicitly asserts its right of directing the succession of the crown, by stat. 13 Eliz. c. 1. On the death of queen Elizabeth, without issue, so that the line of Henry VIII. became extinct, James VI. of Scotland, and I. of England, was the lineal descendant, from the alliance of Margaret, eldest daughter of Henry VII., by Elizabeth of York with James IV. of Scotland; and in him were united not only the claims of different competitors since the Conquest, but likewise the right of the Saxon monarchs, because he was the direct lineal heir of Malcolm, who married Margaret, grand-daughter of Edmund Ironside. Several instances have occurred, in this abstract of the history of the descent of the crown, in which parliament has interposed to fix, direct, and limit the succession; particularly, under Henry IV. Henry VII. Henry VIII. queen Mary, and queen Elizabeth; to which we may also add the stat. 1 Jac. I. c. 1, which recognizes the succession lawfully descending to king James. King James had little reason to value himself, as he did in his first speech to the parliament, March 19, 1603, on his hereditary right and lineal descent. However, parliament, after hearing this speech, was so complaisant as to echo back, not merely in an address, but in an act of the legislature, his words and sentiments on this subject. This act is intitled a "most joyful and just recognition of the immediate, lawful, and undoubted succession, descent, and right of the crown," and expressly declares and enacts "that immediately upon the dissolution and decease of Elizabeth, late queen of England, the imperial crown of the realm of England, and of all the kingdoms, dominions, and rights belonging to the same, did by *inherent birth-right*, and lawful and undoubted succession, descend and come un-

to his most excellent majesty, as being lineally, justly, and lawfully next and sole heir of the blood royal of this realm." This hereditary right to the crown, of which king James here boasted, was a mere chimera, contradicted by the general tenor of cullom from the Norman invasion to his time; by the declared sense of his immediate predecessors; by many solemn proceedings of parliament; and by the express terms of law. Our kings of the Norman race were so far from succeeding as next heirs to one another, and in a regular course of descent, that no instance can be produced of the next heir's succeeding, which is not preceded and followed by instances of the next heir's being set aside. Thus, Edward I. succeeded his father Henry III., but his father Henry III. and his grandfather John, had both been raised to the throne in plain defiance of hereditary right; the right of Arthur, nephew to John, and the right of Arthur's sister, cousin-german to Henry. Edward II. succeeded his father Edward I.; but Edward III. deposed Edward II.; the parliament renounced all allegiance to him, and Edward III. held the crown by a parliamentary title, as much as William III. The British race began in Henry VII., and from him alone king James derived that right, which he asserted in such pompous terms: and if any prince ever came to the crown without the least colour of hereditary right, it was Henry VII. He had no pretence to it, even as heir to the house of Lancaster. His wife, indeed, might have come as heir of the house of York; but the title of his wife was not regarded either by him or the parliament, in making this new settlement. He gained the crown by the good will of the people. He kept it by the confirmation of parliament, and by his own ability. The national union of the two roses was a much better expedient for quiet than a foundation of right. It took place in Henry VIII.; it was continued in his successors, and the nation was willing that it should be perpetuated in James and his family. But neither Henry VIII., nor his son Edward VI., who might have done so with much better grace, laid the same stress on hereditary right, as king James did. One of them had recourse to parliament on every occasion, where the succession to the crown was concerned; and the other made no scruple of giving the crown by will to his cousin, in prejudice of his sister's right. This right, however, such as it was, prevailed: but the authority of parliament was called in aid by Mary, to remove the objection of illegitimacy, which lay against it. Elizabeth had so little concern about hereditary right, that she neither held, nor desired to hold, her crown, by any other tenure than the statute of the 35th year of her father's reign. In the 13th year of her own reign, she declared it by law high treason, during her life, and a præmunire, after her decease, to deny the power of parliament, in limiting and binding the descent and inheritance of the crown, or the claims to it.

The attempt to obtain a bill of *exclusion* in the latter end of the reign of Charles II. evidently supposed that the crown was hereditary, and at the same time liable to the controul of parliament. This attempt proved ineffectual, and James II. succeeded.

However, in consequence of his abdication in 1688, and the declared vacancy of the throne, the lords and commons, representing all estates of the people of the realm, invited over William prince of Orange, and the princess Mary, eldest daughter of king James II., and declared them king and queen, during their lives, and the life of the survivor of them; and settled the crown on the issue of queen Mary; and on failure of such issue, on the princess Anne of Denmark, and her issue. Stat. 1 W. and M.

c. 2. On failure of that to the issue of king William, who was the grandson of Charles I., and nephew as well as son-in-law of king James II., being the son of Mary, his eldest sister. This settlement included all the protestant posterity of king Charles I., except such other issue as king James might at any time have, which was totally omitted through fear of a popish succession. These three persons, king William, queen Mary, and queen Anne, did not take the crown by hereditary right or *descent*, but by way of donation or *purchase*, as the lawyers call it; by which they mean any method of acquiring an estate otherwise than by descent.

By stat. 12 and 13 W. III. c. 2. the princess Sophia, youngest daughter of Elizabeth, queen of Bohemia, who was the daughter of James I., the nearest of the ancient blood royal, and not incapacitated by professing the popish religion, and the heirs of her body, being protestants, and married to none but protestants, were declared next in succession after king William, the princess Anne, and their issue; and it is enacted that they should join in communion with the church of England, as by law established. This is the last limitation of the crown that has been made by parliament; and these several actual limitations, from the time of Henry IV. to the present, clearly prove the power of the king and parliament to create, or alter the succession. It is, indeed, now again made highly penal to dispute it; for by the statute 6 Anne c. 7. it is enacted, that if any person maliciously, advisedly, and directly, shall maintain by writing or printing, that the kings of this realm, with the authority of parliament, are not able to make laws to bind the crown, or the descent thereof, he shall be guilty of high treason; or if he maintain the same by only preaching, teaching, or advised speaking, he shall incur the penalties of a præmunire. After the death of queen Anne, the crown descended to George I. eldest son of the princess Sophia; from him to George II. and last of all to our present gracious sovereign George III. Hence it is easy to collect that the title to the crown is at present hereditary, though not quite so absolutely hereditary as formerly: and the common stock or ancestor, from whom the descent must be derived, is also different. Formerly, the common stock was king Egbert; then William the Conqueror; afterward in the time of James I. the two common stocks united, and so continued till the vacancy of the throne in 1688: now it is the princess Sophia, in whom the inheritance was vested by the new king and parliament. Formerly the descent was absolute, and the crown went to the next heir without any restriction; but now, upon the new settlement, the inheritance is conditional, being limited to such heirs only, of the body of the princess Sophia, as are protestant members of the church of England, and are married to none but protestants. Blackstone's Commentaries, vol. i. chap. 3. See KING and PARLIAMENT.

CROWN-bird from Mexico, in *Ornithology*, the *Touraco* of Edwards, Buffon, and Latham, and the *Cuculus Persa* of Gmelin; which see.

CROWN-wheel of a watch, is the upper wheel next the balance, or that which drives the balance.

CROWN-work in *Fortification*, is a kind of work not unlike a crown. It has two fronts and two branches, and is sometimes made with three whole bastions and two branches, but generally with one whole bastion, two demi bastions, and two wings or branches. It is usually erected before a curtain or a bastion, and commonly serves to enclose some buildings that cannot be brought within the body of the place, or to cover the town-gates, or to occupy some commanding or advantageous spot of ground, which the

the enemy might otherwise make use of against the place.

From the salient angle, A, of the bastion TR A S V, (*Plate VIII. Fortificat'on, fig. 19.*) as a centre with a radius equal to about 120 toises, describe an arc of a circle cutting the capital of the bastion produced in the point B; from the said point B, set off or inscribe the chords B C, B H, each of them equal to 110 toises; on each of which, as on an exterior side, construct a front of a polygon, by drawing perpendiculars, D E, K I, to the middle points, D, K, of the exterior sides, B C, B H, the lines, B E O, C E N, B I Q, H I P, of defence through the inward extremities, E, I, of the said perpendiculars, and finding the flanks, G N, F O, L P, M Q, according to Vaub'in's first method for constructing the body of a place. If you follow him, you will make the perpendiculars, D E, K I, each equal to about 18 toises, and the faces, B G, B L, of the bastion, and those C F, H M, of the demi-bastions, each equal to about 30 toises, and will make the branches C a, H b, when produced, terminate on the faces of the adjacent ravelins within 25 toises of their extremities. But if in constructing such a work, you wish to make the flanks either equal to, or in a given ratio to the perpendiculars, you must have recourse to Mr. Glenie's rule, delivered in the article CONSTRUCTION *military*, the only one for this purpose that has ever been delivered by any writer on fortification.

The ditch of this work should be about 12 toises broad, and opposite to the branches its counter-carp is parallel to the same, but in front terminates, when produced at the shoulders, like the great ditch of the body of the place. The parapet should always be 3 toises thick, in order to resist cannon shot.

Sometimes small ravelins, having their capitals equal respectively to about 35 toises, are made opposite to the curtains of the crown-work, with ditches before them of about 8 toises wide.

CROWN-Work is also a term sometimes made use of to denote the most advanced part of a work when besieged.

CROWNED, in *Farriery*. A horse is said to be crowned, when by a fall, or other accident, the knee is so hurt, that the hair falls off, without growing again.

CROWNED *horn-work*, is a horn-work, with a crown-work before it.

CROWNING, in *Architecture*, is understood, in the general, of any thing that terminates, or finishes a member or decoration.

Thus, a cornice, a pediment, a croteria, &c. are called crownings. Thus, also, the abacus is said to crown the capital; and thus any member or moulding is said to be crowned, when it has a fillet over it; and a niche is crowned, when it is covered with a capital.

CROWNING, in *Sea Language*, denotes the finishing part of a knot made at the end of a rope. It is performed by laying the first strand over the walling, and the second strand across over the first, and the third strand across over the second, and through the bight of the first; then hauling the ends tight. These crownings are useful in all kinds of floppers.

CROWTH, or CRÛTH, an instrument of music (see *Plate, Music*.) resembling a violin, formerly in common use in the principality of Wales, as a tenor accompaniment to the harp; but now become extremely rare in that country. The length is $20\frac{1}{2}$ inches, the breadth at bottom $9\frac{1}{2}$, tapering towards the top to 8 inches; its thickness is $1\frac{8}{16}$, and the finger board measures 10 inches in length. It has six strings, supported by a flat bridge, placed obliquely to the sides, and

is played on with a bow. A, A, represent the apertures for the hand; B, B, the strings conducted under the end board; C, C, the pegs, and *d, d*, the sound holes. The fifth and sixth strings are the unison and octave of G, the fourth and third the same of C, and the second and first the same of D; so that the second pair of strings are a fourth, and the third a fifth to the first.

Some have supposed this instrument to have been the parent of the violin; but it is much more extensive in its compass. Two or three of the lower strings are often struck with the thumb, and serve as a base accompaniment to the notes sounded with the bow.

This instrument was not peculiar to Wales; since a figure of it has been lately discovered among the outside ornaments of the abbey church of Melros, in Scotland, built about the time of Edward II.

From the name *crowth* is derived *crowther*, a *crowder*, as a common fidler is now called. The use of this instrument is almost lost.

The Welsh had also a three-stringed crowth, which was the ancient base viol.

CROXAL, SAMUEL, in *Biography*, was born at Walton on Thames, of which place his father was vicar. The exact date of his birth has not been ascertained. He was educated at Eton, and from thence he removed to St. John's college Cambridge, where he was distinguished for his poetical turn, and also for his attachment to the whig interest, in defence of which he employed his talents during the latter end of queen Anne's reign. His political pieces are now little known, and he is chiefly remembered by his translation of Æsop's Fables, a work which, in some shape or other, is read by almost every young person. His first situation in the church was at Hampton, Middlesex, of which place he was vicar. After this he had successive preferments of considerable emolument, and lived in the enjoyment of some of them to an advanced age: he died Feb. 13, 1752. His principal works are, 1. "The Fair Circassian," for which he was highly blamed by his contemporaries, in having prostituted his muse to purposes of licentiousness, by converting the Song of Solomon into an amorous dialogue between a king and his mistress: "Such a profanation," says Mr. Cragg, "was not to be expected from a clergyman." 2. "Scripture Politics," being a view of the original constitution, and subsequent revolutions of the Jews. This work was intended as an introduction to the knowledge of the Old Testament, adapted to uninformed readers. Two years before his death, he published "The Royal Manual," which was generally supposed to be written by himself; though, in his preface, he stated it to have been the production of the celebrated Andrew Marvel. Dr. Croxal was the author of some single sermons, published at different times, and on particular occasions. *Biog. Brit.*

CROY, in *Geography*, a small town of France, in the department of the Somme, 6 miles N.W. of Amiens. It had the title of a dukedom before the French revolution of the year 1789.

CROYDON, a township of America, in the state of New Hampshire and county of Cheshire, adjoining Cornish, and about 18 miles N. E. of Charlestown, incorporated in 1761, and containing, in 1775, 143, and in 1790, 537 inhabitants.

CROYDON *Town*, a vicarage in Croydon hundred, in the county of Surrey; this town is situate near to the ruptured edge of the London clay-stratum, having the sand under the same exposed on the surface on the S. E. and S. W. sides of the town, and a little further on the chalk strata appear from under these. In 1805, the Surrey iron rail-way

(northern

(northern part) was completed up to this town from the Thames at Wandsworth, and the southern part of the railway, under the same title, was completed to Merlham, and in 1807 the Croydon canal was also completed, opening a communication from the Thames at Rotherhithe to this town. See CANAL.

CROYDON Canal, is the parliamentary name of a navigable canal, extending about $9\frac{1}{2}$ miles in the counties of Kent and Surrey, between the grand survey canal near Deptford, to the N. E. corner of the town of Croydon. See CANAL. For seven miles at the southern end, this canal is cut in the top or surface of the London clay-stratum elevated above its natural position, the remaining $2\frac{1}{2}$ miles descend by a series of locks and deep-cuttings down the edges of the same strata, and prevented while cutting, and still in many of its new banks, the finest opportunity which has perhaps ever occurred, of examining the several stratified and extraneous matters, comprising this interesting part of the British series of strata. See CLAY strata.

CROYLE STONE, in *Mineralogy*, a kind of spar, consisting of small crystals, mentioned by Woodward, as found in the mines in the peak of Derbyshire.

CROZAT, in *Geography*, a canal of France, in the department of the Aisne, which begins at St. Quentin, and terminates at Chauny. It has ten locks, and is 41,866 metres, or 21,358 fathoms long. However, since the year 1798, its navigation has been completely interrupted by the bad state of its locks. Herbin. *Statistique de la France*, vol. v. p. 118.

CROZET, a small town of France, in the department of the Loire; 12 miles N. W. of Roanne.

CROZIER, in *Natural History*, is the name of a fossil shell described by Breynius with open spiral turns, somewhat like a bishop's crozier. (See CROSTER.) Da Costa, *Conchology*, Tab. II. figs. 18 and 19, has figured a recent shell from the Indies, which he thinks resembles closely this fossil shell.

CROZIERED ABBOT. See ABBOT.

CROZON, in *Geography*, a small town of France, in the department of Finistère, chief place of a canton, in the district of Chateaulin, with a population of 7942 individuals. The canton itself has 7 communes and 12,188 inhabitants, upon a territorial extent of $237\frac{1}{2}$ kilometres.

CRUACHAN BEN, a solitary mountain of Scotland, in Argyleshire, which is very high, (being about 3300 feet above the sea) and situate near the sea, on which account general Roy recommended that it should be used with Ben Nevis for a series of accurate experiments on terrestrial refraction. See Phil. Transf. 1790, p. 246.

This mountain, according to Mr. Jameson, consists, at the base, of slate and micaceous schistus, which is followed by granite to the top.

CRUANACARRA, a small island in the Atlantic Ocean, near the west coast of the county of Galway, Ireland. Long. $9^{\circ} 59'$ W. Greenwich, lat. $53^{\circ} 15'$ N.

CRUANAKILLY, a small island in the Atlantic Ocean, near the west coast of the county of Galway, Ireland. Long. $9^{\circ} 59'$ W. Greenwich, lat. $53^{\circ} 18'$ N.

CRUCCINI, or **CRUZINI**, a small town of France, in the island of Corsica, department of Liamone, not far from Vico. It is the chief place of a canton, in the district of Vico, and has 1126 inhabitants.

CRUCES, a town of South America, in Terra Firma, 5 leagues from Panama, situated on Chagre river, which begins to be navigable at this place; and distant from the mouth of the river, by the nearest course, 21 miles, but by the several windings of the river 43 miles. At this town is a

custom-house, where an account is taken of all goods brought up the river.

CRUCHES à feu, Fr. These are earthen pots or pitchers with two handles, which are with grenades full of powder without fuses. The interstices or intervals between the grenades are also filled with powder. The mouth of the cruche, or pot, is covered with sheep skin, which, by means of the handles, is firmly tied round the neck of it. A match is then fastened to each handle, which, after being lighted, the cruche is thrown upon the enemy when they attempt to mount the breach in a work. As soon as it falls it breaks, and the fire of the matches communicates itself to the powder and grenades. In case of a deficiency of shells, they might be thrown by the besieged into the works of the besiegers, or by the besiegers into the works of the place besieged.

CRUCIAL INCISION, in *Surgery*, an incision, or cut, into some fleshy parts, in form of a cross.

CRUCIAN, in *Ichthyology*, a species of cyprinus, common in many of the fish-ponds about London, and other parts of the south of England, though probably not a native fish. The meat of it is coarse, and little esteemed. See CYPRINUS.

CRUCIANELLA, in *Botany*, (diminutive of crux, so called because some of the species have their leaves in fours, placed cross-ways.) Linn. gen. 126. Schreb. 163. Willd. 186. Lam. Ill. 161. Gært. 131. Juss. 197. Vent. 2. 566. (Rubeola; Tourn.) Class and order, *tetrandria monogynia*. Nat. Ord. *Stellatae*, Linn. *Rubiaceae*, Juss.

Gen. Ch. *Cal.* Involucre two or three leaved, or two-parted; leaves linear lanceolate, keeled, acuminate, often connivent-compressed; proper calyx none. *Cor.* monopetalous, funnel-shaped; tube filiform; border four or five cleft; segments acuminate, inflexed. *Siam.* Filaments four or five, placed in the mouth of the tube; anthers simple. *Pyl.* Germ inferior; egg-shaped, compressed; style filiform, bifid; stigmas two, obtuse, or capitate. *Peric.* Capsules two, connate, naked, not dehiscent. *Seeds* solitary, oblong. (*Pericarp* none, except the external coat of the seed; Gært.)

Est. Ch. Involucre to each flower two or three leaved, or two-parted; proper calyx none, corolla superior funnel-shaped, with a filiform tube; capsules two, oblong, naked.

Obs. Linnæus and Jussieu consider the involucre as a proper calyx, to which Gærtner, La Marck, and Ventenat object, as contrary to the general character of the family.

Sp. 1. *C. angustifolia*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ill. Pl. 61. Willd. 1. Gært. tab. 24. fig. 3. Sabb. Hort. 2. tab. 12. (Rubeola angustiore folio; Tourn. 130. Rubia angustifolia spicata; Bauh. pin. 334. Barrel. ic. 550. Pseudo rubia; Moris. hist. 3. § 9. tab. 22. fig. penult.) "Erect; leaves in sixes, linear; flowers in spikes." Root annual, fibrous. *Stems* several, from six to nine inches high, procumbent at the base, afterwards ascending very slender, quadrangular, smooth. *Leaves* narrow, acute, shorter than the internodes. *Spikes* two or three inches long, terminal, erect, imbricated, not interrupted, variegated with green and white. *Corollas* scarcely longer than the bractes and the involucre. A native of the south of France and Italy. 2. *C. mucronata*. Roth. cat. bot. 1. 27. "Erect; leaves in fours, linear, mucronate; spikes alternate; involucre three-leaved." According to Willdenow scarcely more than a variety of the preceding species. 3. *C. bifolia*. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Willd. 2. (Rubia; Barrel. ic. 520 and 549. R. spicata cretica; Clus. hist. 2. 177. R. latifolia; Bauh. pin. 334. Rubicola latiore folio; Tourn.

Tourn. 130.) "Procumbent; leaves in fours, lanceolate; flowers in spikes." Nearly allied to *C. angustifolia*, and as Linnaeus himself suspected, perhaps only a variety. Ray observes that it differs from it only in having broader leaves and spikes, and in being a larger plant. Like it, it is sometimes erect. A native of the island of Candia, Italy, and the south of France. 4. *C. monspeliaca*. Linn. Sp. Pl. 5. Mart. 6. Lam. 3. Willd. 9. (*C. repens*, foliis fenis, foicis longis; Sauv. monsp. 104. *Rubia spicata repens*; Magn. monsp. 225. *Rubeola lupina*, spica longissima; Tourn. 130.) "Procumbent; leaves acute; those on the stem, in fours, egg-shaped; on the branches, in fives or sixes; flowers in spikes." Root annual. Stems several, a little ascending in their upper part, branched, somewhat rough at the angles. Spikes five or six inches long, slender, variegated; corollas longer than the bractes. A native of the south of France and the county of Nice. 5. *C. maritima*. Linn. Sp. Pl. 4. Mart. 5. Lam. 4. Willd. 7. (*Rubia maritima*; Bauh. pin. 334. *R. marina*; Barr. ic. 355. *Rubeola maritima*; Tourn. 130.) "Procumbent, somewhat shrubby; leaves in fours, mucronate; flowers opposite, quinquefid." Root perennial. Stems about a foot long, almost woody, permanent, branched, leafy their whole length. Leaves short, ovate-lanceolate, acute, stiff, glaucous, edged with white. Bractes egg-shaped, mucronate, glaucous, with white and scarious edges; growing crosswise in fours and forming a loose spike. Flowers in the axils of the bractes, almost sessile, yellowish, sometimes with a tinge of red on the outside, shutting in the day, and opening at night, sweet-scented; the divisions of the border ending in very long points. A native of France, Italy, and Candia. 6. *C. Aegyptiaca*. Linn. Mant. 38. Mart. 3. Lam. 5. Willd. 3. (*C. herbacea*; Forsk. Aegypt. 30.) "Leaves in fours, chiefly linear; flowers in spikes, quinquefid." Root annual. Stems not at all woody, procumbent and diffuse near the root, erect-spreading in the upper part. Leaves revolute, somewhat scabrous on their upper surface, and at the edges; the lowest egg-shaped, those next above lanceolate, the rest linear. Spikes terminal, solitary, rather loose. Bractes lanceolate, not keeled. Flowers small, longer than the bractes, yellowish-white; divisions of the border mucronate, as in the preceding species. A native of Aegypt. 7. *C. patula*. Linn. Sp. Pl. 3. Mart. 4. Lam. 6. Willd. 4. Læf. It. 68. "Diffuse; leaves revolute at the edges; bractes linear-awl-shaped, a little scabrous, flowers feathered." Root annual. Branches spreading. Leaves scabrous. Flowers axillary, yellow, quinquefid, firm. A native of Spain. 8. *C. ciliata*. Lam. 7. Willd. 5. (*C. diffusa*; Roth. Cath. Bot. 1. 26.) "Diffuse, generally in fours, linear, keeled; bractes linear, ciliated; flowers scattered." Root annual. Stems six or seven inches high, slender, feeble, quadrangular, leafy, branched. Leaves acute, often revolute at the edges, a little scabrous on the upper surface. Bractes in a loose terminal spike, opposite, acute, strongly keeled. Flowers sessile in the axils of the bractes, solitary; leaves of the involucre ciliated like the bractes, erect, but not connivent; germ rather large, wrinkled. Seeds egg-shaped, covered with obtuse scale-like tubercles, variously contorted. A native of the Levant. 9. *C. pubescens*. Willd. 6. (*Rubeola cretica incana*; Tourn. Cor. 5.) "Erect; leaves generally in sixes, linear, pubescent; heads of flowers peduncled, axillary and terminal." Whole plant hoary-pubescent. Stem obtusely quadrangular. Flowers purple; tube three times the length of the involucre; border flat, with five obtuse divisions. A native of Candia. 10. *C. capitata*. Lam. Ill. 1410. Willd. 8. Billard. Icon. Pl. Syr. Decaf. 1. tab. 3. "Procumbent,

somewhat shrubby; leaves in sixes, ovate-lanceolate; flowers in heads, quinquefid." Root perennial, horizontal, strong, woody. Stem about three inches long, weak, naked near the bottom, with filiform branches. Leaves acute, scabrous, revolute at the edges. Flowers dark-coloured, some peduncled, others sessile; involucre one-leaved, two-parted, with six or seven teeth. A native of mount Lebanon, near the summit. 11. *C. hispida*. Mart. 7. Mill. "Stem hispid; leaves lanceolate, hirsute, opposite; flowers in a terminal umbel. Stems quadrangular, rough, prickly, bending downward. Flowers blue, quadrifid. 12. *C. americana*. Mart. 8. Mill. "Stem erect, villous; leaves linear lanceolate, hirsute, opposite; flowers axillary, solitary. Stem near three feet high, shrubby, branched. Leaves covered with stinging hairs. Flowers pale blue. The last two were sent by Dr. Houlton from La Vera Cruz in New Spain. The plants grew in the Chelsea garden very well during the summer, but perished in the autumn before the seeds were ripe.

CRUCIATA, *C.* Bauh. Tourn. Barr. &c. See ASPERULA, GALIUM, RUBIA, and VALANTIA.

CRUCIATA montana minor flore caruleo; Barr. See ANAGALLIS monelli.

CRUCIATÆ, in Entomology. See CICADA.

CRUCIBLE, in Chemistry. Crucibles are small vessels made of earthenware metal, or other materials, employed by chemists in operations with the naked fire, such as fusions and reductions of metallic ores in the small way, vitrifications of earthy mixtures, calcinations, &c. &c. The construction of these vessels is of no small importance to the chemist; and many observations will suggest themselves with regard to their selection and proper use.

1. *Of earthen crucibles.* Formerly, when chemists made their own crucibles and fire-pots, the subject engaged much of the attention of such eminent practical operators, as Pott, Glauber, Agricola, Cramer, &c. and more lately a considerable improvement has been made by that eminent scientific manufacturer, the late Mr. Wedgewood.

A pottery ware, which should unite all the requisites for a good crucible, should be infusible at almost any heat, close and compact in texture, so as to retain saline and metallic fluxes for a considerable time, without being materially acted on by them, or allowing them to pass through; and should be able to bear sudden changes of temperature, without cracking or splitting. It is found, however, that all these requisites are incompatible in the same ware; so that a selection must be made, according to the intended use.

For enduring the most intense heat, without fusion, the hard, coarse, brown crucibles, originally made at Waldenburg, in Hesse, have long been the most esteemed. They are manufactured, according to Pott, by mixing a very refractory clay with a coarse sand, the finer parts of which have been separated by the sieve and rejected. These vessels are not turned on the potter's lathe, as this would require a considerable portion of water to bring them to the requisite degree of plasticity, but the mass is barely moistened, and is then fashioned into the proper shape, by being strongly rammed into an iron mould. The crucibles are then very slowly dried and baked. The genuine Hessian crucibles are extremely hard, and (unless filled with any substance that acts as a powerful flux) they are only softened, but not melted down, by a heat of sufficient intensity for any chemical operation. Though the coarseness of their texture tends to render them porous, this defect is counteracted, in a great measure, by the very small quantity of water used in making them, and the consequent smallness of the

shrinkage whilst drying; and their coarseness enables them to bear a pretty rapid heating and cooling without cracking.

The ordinary brown crucible ware used in this country, is whiter and finer than the Hessian, but is softer, more crumbly, and much more porous; so that litharge, when in fusion at a full red heat, runs through this ware nearly as easily as water soaks through a sponge. It is also more fusible than the Hessian, though it is sufficiently refractory for most purposes.

The most infusible material for fire-pots that is known, and which resists the operation of saline fluxes for the longest time, is a mixture of burnt and unburnt clay; and this is the composition of the large pots or crucibles used in glass-making. The peculiar advantage of this mixture is, in substituting baked clay to sand, or any other silicious earth, and thus increasing the proportion of alumine, which is an earth of difficult solution in fluxes, and diminishing that of flint, which is more soluble.

Crucibles intended for the fusion of metals are much improved by a mixture of plumbago. This substance is infusible *per se*, and being protected from the action of the air by being involved in the clay, its carbonaceous ingredient escapes combustion. It has the additional advantage of having no affinity whatever with the earths, and, therefore, does not dispose them to fusion; and the unctuous softness of this material gives a great smoothness to the surface of the crucible, which prevents it from detaining any portion of the melted material when poured out. The black-lead ware will bear sudden heating and cooling better than any other; and it is so soft, that it may readily be sawed or cut with a jagged knife, whereby the chemist may easily fit himself with stoppers, covers, &c.; but its extreme porousness renders it unfit to retain any kind of saline flux.

The useful fire-ware invented by Mr. Wedgwood is a very fine, hard, close grained porcelain biscuit, made of very pure clay and flint, which are brought to extremely fine powder before they are worked. This gives a closeness of texture superior to any other pottery; so that crucibles made of it will long retain saline fluxes; and retorts will serve for the distillation of the most corrosive liquors, without requiring any glazing. Experience has shewn, however, that no kind of earthenware remains impervious to air, when very strongly heated. The great inconvenience attending the Wedgwood fire-pot ware is, its extreme liability to crack whilst heating or cooling, which is owing to its porcelainous hardness, and the closeness of its texture. This inconvenience is, in some measure, remedied, by giving the crucible a slight coating of loam or clay.

It is often required, in chemical operations, to line the inside of a crucible with charcoal; as, for example, in the reduction of many of the simple metallic oxyds, or carbonated oxyds, such as the oxyds of manganese, copper, or lead, and for other purposes. This is sometimes done by cutting down a piece of charcoal to fit the cavity of the crucible, and then scooping a hollow in the charcoal; but it is a better and more speedy way to mix up some charcoal powder with a very little linseed meal, to moisten the mass just sufficient to make a slightly adhesive mass to line the crucible with it, and to dry it in a red heat, by which the volatile parts of the linseed fly off, and a sufficiently firm charcoa is left.

The form of the ordinary earthen crucibles is round, or three-cornered, or sometimes barrel-shaped; and they are usually furnished with stoppers of the same material, with a small hole through the top, opening obliquely, to allow the escape of any vapour, when the joining is closed by lute,

and at the same time to prevent any of the dust of the fuel from falling in. As the lower part of the crucible would escape the greatest heat of the furnace, if put immediately upon the bars, and would be liable to crack by the current of cold air, the crucible is generally set on a solid earthen stand, which raises it an inch or two from the grate. The lid of the crucible may be luted on by a mixture of clay and sand; or, if it is required to be quite impervious, a mixture of pipe-clay, with about a tenth of glass of borax, may be employed, which, in a red heat, consolidates into a semi-fused tenacious mass.

Crucibles are also made of silver, iron, and platina. A silver crucible is almost indispensable in the analysis of earths and stones when they require to be first treated with caustic alkali; for, if earthen vessels are used for this purpose, the alkali acts also on the substance of the crucible, and thus much confusion is introduced in the process; whereas pure silver is not in any way acted on by alkali. The silver employed for this purpose should be freed from alloy, either by cupellation, or by being recovered from luna cornea. Silver, when perfectly pure, and laminated into a thin plate, is fusible at a full red heat, not more intense than can be made in a common fire; so that a crucible of this material will but just bear the heat required for the perfect fusion of the fixed alkalies, and will hardly retain the melted alkali for any great length of time. It is found, however, that this heat is by no means necessary, for most earths are completely *resolved*, or rendered soluble in water or acid, by previous ignition with alkali, for about an hour, in a heat short of fusion.

When a very strong heat is required to be given to the mixture of alkali and earths, chemists sometimes employ an iron crucible, previously cleaned and smoothed on the inside, which is often found very useful for other purposes.

Lastly, we may mention platina as a material for crucibles, which has been found of such singular utility for a vast variety of uses, that it is almost indispensable to the analytical chemist. Platina has the advantage of bearing the utmost intensity of heat without fusion, and not being in any degree oxydated by exposure to air, the smoothness and polish of the surface remain uninjured; so that substances which are heated in it may be detached with great ease and accuracy. There are few substances that act on platina; so that most operations that require heat may be performed safely in vessels made of this valuable metal: the particular mode of working it will be mentioned under the article PLATINA. It unfortunately happens, however, that the alkalies, when in strong fusion, dissolve a sensible portion of this metal; and hence it is not equally valuable with pure silver under these circumstances. When platina crucibles are strongly heated, in contact with coak or coal, they should be enclosed loosely in crucibles of earthenware, otherwise the vitreous slag of the coal is apt to adhere strongly to the outside of the platina vessel, and cannot be got off without much difficulty.

CRUCICOLÆ, q. d. *worshippers of the cross*, a designation given to the primitive Christians, by the heathens.

CRUCIFERÆ, in *Botany*, the third natural order of the thirteenth class in the system of Jussieu. It consists of dicotyledonous polypetalous hypogynous plants, with the following peculiar character. *Calyx* four-leaved, alm. it always deciduous. *Petals* four, disposed in the form of a cross, alternate with the leaves of the calyx, most frequently furnished with claws, inserted into an hypogynous disk. *Stamens* six, with the same insertion; four longer, in opposite pairs; two shorter, solitary, and opposite to each other, between the pairs; each of the pairs, and of the solitary filaments

filaments opposite to a leaf of the calyx. *Germ* simple, situated upon the stamiferous disk, which is sometimes tumid between the longer and shorter stamens, and thence appears quadriglandular; style one or none; stigma most frequently simple. *Fruit* either a silique or a silicle, *i. e.* either long or short; generally two-celled, and with many seeds, two-valved; valves opening lengthwise, and entirely separating from each other; partition membranous, seminiferous on each of its edges, sometimes extending beyond the valves, and forming a kind of beak. Perisperm none. *Stems* herbaceous, rarely shrubby. *Leaves* alternate (in a single instance, opposite.) *Flowers*, for the most part, not axillary, scattered, or in terminal spikes, rarely panicled.

This family is universally allowed to be a very natural one, and, with some slight variations, has been kept separate by most systematic botanists. It corresponds exactly with the Linnæan class tetradynamia, except that it excludes cleome, a rather anomalous genus, which does not well accord with the others, and which Jussieu has therefore removed to the capparides, his next succeeding natural order. Jussieu has thrown the genera, as Linnæus had done before him, into two divisions, according to the length of the seed-vell, and the absence or presence of a style. Ventenat has made some alteration in the arrangement and number of genera. In his "Tableaux du regne Vegetal," the order stands thus: I. *Eruceæ*. Style scarcely any. Fruit a silique, two or many-celled, terminated by a kind of tongue or beak; raphanus; raphanistrum, separated from the preceding; sinapis; brassica. II. *Cheiranthoides*. Style scarcely any. Fruit a silique, two-celled, terminated by a point, which is commonly very short; arabis, including turritis; hesperis; cheiranthus; erythimum; silybrium; radicle, separated from silybrium; cardamine; dentaria. III. *Athyoides*. Style apparent. Fruit a silicle, two-celled, rarely one-celled. Lunaria; rieotia, separated from lunaria; bilcutella; clypeula, including peltaria; alyssum; vesicaria, separated from alyssum; draba; cochlearia; coronopus, separated from cochlearia; iberis; thlaspi; capfella, separated from thlaspi; nasturtium, separated from lepidium; lepidium; camelina, separated from myagrum; anallatica; vella. IV. *Myagroides*. Style apparent, or scarcely any. Fruit a silicle, from one to four-celled, valveless; cells with only one seed in each, some of them often abortive; myagrum; rapistrum, separated from myagrum; bunias; erucago, separated from bunias; cakile, separated from bunias; pugionum, also separated from bunias; crambe; isatis.

Most of the plants of this natural order are hot to the taste, contain a portion of volatile alkali, and are reckoned detergent, diuretic, and antiscorbutic. The roots or leaves of several of them are some of the most common esculent vegetables, and are esteemed nutritious to man and to beast. It appears, from some experiments made in France by Deyeux and Beanmé, that these plants contain sulphur, combined with their odorous principle; and that this combustible body, reduced to the state of an elastic fluid by its combination with hydrogen, constitutes their aroma.

CRUCIFIX, a cross, whereon the body of Jesus Christ is fastened in effigy; much used by the Romanists in their churches, and other places, to recognize the passion of Jesus Christ, and direct their prayers to.

There are some chapters wherein Jesus Christ is the first canon, and the income of the canonry goes to the subsistence of the *crucifix*.

CRUCIFIXION, an ancient form of execution, by fastening the criminal to an erected cross. See CROSS.

CRUCIFORM FLOWER, *flos cruciformis*, in *Botany*, is

so called from the resemblance of its four spreading petals to a cross. Such flowers constitute a very natural order of plants; as well as a class in Tournefort's system, and even in that of Linnæus; his *Tetradynamia* being entirely composed of such, with the exception of *Cleome*, which some botanists judge to be improperly placed there, even according to the Linnæan character of that class. See CRUCIFERÆ, COROLLA, and CLEOME. S.

CRUCIS, EXPERIMENTUM. See EXPERIMENTUM.

CRUCITA, in *Botany*, Juss. See CRUZITA.

CRUCKFALLA, in *Geography*, a mountain of the county of Donegal, Ireland, near Bloody Farland-point.

CRUCOLI, a town of Naples, in the province of Calabria Citra; 6 miles S.E. of Curati Vecchia.

CRUDE, something that has not passed the fire, or has not had the degree of concoction, *i. e.* of heat, requisite to prepare it for eating, or some other use.

Crude, or raw silk, is that which has not been put in boiling water, to unwind it from off the cod; nor boiled in water and soap, to fit it for dyeing.

CRUDE *sugar*. See SUGAR.

CRUDE *antimony*, is that which comes immediately from the mines, without any preparation, except once melting.

CRUDE *humours*, in *Medicine*, or rather in the old humoral pathology, were the humours in an unconcocted state. In the early state of inflammation, when the secretions are thin and watery, they were termed *crude*, in contradistinction from the subsequent state of suppuration, when a thick and purulent discharge takes place, which was said to be *concocted* or digested. The terms were extended, by analogy, to all the discharges from the body in febrile diseases in general, as we have shewn under the heads of CONCOCTION and CRISIS; which see.

CRUDEN, ALEXANDER, in *Biography*, well known for his excellent Concordance of the Bible, was born in 1701 at Aberdeen, where he received his grammar learning: he afterwards studied at Marischal college, with a view of entering the church. Unfortunately, before the period arrived when he could be admitted to officiate as a public instructor, such decided symptoms of insanity appeared in his conduct, as rendered confinement necessary. Throughout the whole of his life he believed that he was delegated by Heaven to reform a guilty world; and his conduct in a thousand instances demonstrated an ardour and zeal for the good of his fellow-creatures, that merited the highest applause. Thrice, however, was he shut up in a private mad-house, in which, if the nature of his disease did not lead him to exaggeration, he was cruelly treated. Once indeed he brought his action against a respectable physician, and other persons connected with him; the cause was tried, and Cruden was unable to make out a case. The verdict was given in favour of the defendants; but to the public he made an appeal; and the description of the treatment which he experienced, or which he asserted that he had experienced, cannot fail to excite the commiseration of every feeling heart. That most deplorable malady to which humanity is subject, is, we fear, too frequently treated with a degree of harshness that cannot be justified upon any principles. On his release from his first confinement he came to London, and engaged in some respectable families as private tutor. In the same employment he spent some years in the Isle of Man, and in 1732 he opened a shop in London, under the Royal Exchange, as bookseller, and employed all his vacant time as a corrector of the press. In the following year he began to compile his great work, *viz.* "A complete Concordance of the Holy Scriptures of the Old and New Testament." We can scarcely conceive any literary work that

that required more patient labour than this, and few have been executed with greater accuracy. He had nearly executed the whole before he looked for public remuneration. The first edition was published in 1737, and dedicated to queen Caroline, who had led the editor to expect her patronage; her majesty unfortunately died a few days before the work could be got ready. The author's affairs were now embarrassed; he had none to look to for assistance, and in a fit of despondence he gave up his trade, and became a prey to melancholy. Shortly after this, he assumed the title of "Alexander the Corrector," maintained that he was divinely commissioned to reform the manners of the age, and restore the due observance of the sabbath. To prophecy he appealed, in which he saw his own character delineated. He sought, however, for earthly honours, and requested of his majesty the dignity of knighthood, and earnestly solicited his fellow-citizens to elect him member for the city of London. Both were deaf to his entreaties, and he turned from public offices to duties for which he was better qualified. He laboured almost incessantly, sometimes in works of pure benevolence, and at others as corrector of the press, and seldom allowed himself more than four or five hours for sleep. In 1770 he left Aberdeen for London; he took lodgings at Islington, where he died November the first. In private life Mr. Cruden was courteous and affable, ready to assist all that came within his reach, as well with his money as with his advice, which was founded upon the principles of practical religion. He was, with regard to doctrines, a Calvinist; but, what is much better, he was a good man, and, like his great Master, exercised in works of piety and true benevolence. *Biog. Brit.*

CRUDEN, in *Geography*, a bay of Scotland, formed by a river of the same name, on the east of the county of Aberdeen; 8 miles S. of Peterhead.

CRUDIA, in *Botany*, (named after a botanist called Crudey, by whom the plant was communicated to Schreber.) Schreb. 711. Willd. 821. Class and order, *decandria monogynia*.

Gen. Ch. *Cal.* Perianth one-leaved; tube short, compressed-top shaped, gibbous before at the base, with an oblique mouth, permanent; border four-parted, unequal, spreading, deciduous; upper segment roundish, concave; the others egg-shaped, very obtuse, less concave. *Cor.* none. *Stam.* Filaments ten, filiform, a little broader at the base, bent in the middle, inserted into the neck of the calyx, and twice the length of its segments; anthers roundish, adnate. *Pist.* Germ. leynitar-shaped, lispid, erect, affixed to the bottom of the calyx by a pedicel as long as the tube, inclined to the upper segment; style capillary, inflexed the length of the stamens, proceeding from the back of the germ; stigma thickened, obtuse. *Peric.* Samara very large, egg-shaped, one celled. *Seeds* two, roundish, depressed.

Ess. Ch. Calyx one leaved; border four parted. Corolla none. Filaments dilated at the base. Samara with about two seeds, egg-shaped.

Sp. 1. *C. spicata*. Willd. 1. (*Apelatoa spicata*; Aubl. Guian. 1. 363. tab. 147.* "Leaves pinnated; leaflets oblong-lanceolate, acuminate." *Root* perennial. *Leaves* alternate, smooth. *Racemes* simple, axillary. Willdenow, under the genus *pterocarpus*, has directed this species to be removed from the present genus, probably for a reason which Mr. König has shewn to be ill-founded, on the authority of Aublet's original specimen in the herbarium of sir Joseph Banks. See *Annals of Botany*, vol. 1. p. 358. 2. *C. aromatica*. Willd. 2. (*Touchoiroa aromatica*; Aubl. Guian. 215. tab. 148.*) "Leaves simple, elliptical, acuminate."

Different from the preceding chiefly in having simple leaves. Both species are natives of woods in Guiana.

CRUDITY, in *Medicine*, the condition of the humours previous to concoction. See CRUDE.

CRUELTY, in *Ethics*, is a habit of mind, directly opposed to mercy and compassion, disposing men to take delight in inflicting misery and punishment, and in satiating the thirst after these, by beholding the torture and anguish of the sufferers, independently of any consideration of injury received or suffered. According to the arrangement of Dr. Hartley, it belongs to that class of affections which lead us to rejoice at the misery of others. Cruelty and malice, says this writer (*Obs. on Man.* p. 284.) are the genuine and necessary offspring of anger indulged and gratified. They are most apt to arise in proud, selfish, and timorous persons, those who conceive highly of their own merits, and of the consequent injustice of all offences against them; and who have an exquisite feeling and apprehension in respect to private gratifications and uneasinesses. Cruelty to brute animals indicates a mind destitute of reflection and sensibility. In the more atrocious instances of it, it either springs from, or tends to cherish, a savage disposition; and in those cases, in which it forms a part of men's amusements and pastimes, it is culpable in its source, and injurious in its effects. Bull-baiting, cock-fighting, and such sports, which some have reckoned as manly, are remnants of barbarity; and there are other amusements and sports, which ought to be restrained and discouraged on account of the cruelty that attends heedlessness and wantonness; but as it is of pernicious influence it ought to be checked and prohibited, particularly in the early periods of life. As a preservative against all wanton acts of cruelty, even in favourite pastimes, we would recommend, more especially to young persons, the perusal of Thomson's *Spring*, in his *Seasons*. It may serve to check the practice, or at least to diminish the pleasure, of those who torture worms and other insects in the amusement of fishing; and of others who, for the indulgence of a vitiated appetite, blend the most unfeeling cruelty with the arts of cookery. Referring to the former species of cruelty, the humane and moral poet describes it in the following lines:

"But let not on thy hook the tortur'd worm,
Convulsive twist in agonizing folds;
Which, by rapacious hunger swallow'd deep,
Gives, as you tear it from the bleeding wretch,
Of the weak, helpless, uncomplaining wretch,
Harsh pain and horror to the tender heart."

In the education of youth, it is of great importance that no wanton, and more especially no deliberate act of cruelty, should be permitted or encouraged.

CRUGER, or KRUGER, THEODORE, in *Biography*, an engraver, born at Munich about the year 1576, but though a native of Germany, he resided during the greater part of his life in Italy. He appears to have attempted the manner of Francesco Villamena; but his prints, though executed in a bold style, lose their effects from his ignorance of the distribution of light and shade. He died at Rome about the year 1650. His plates are usually marked with a cypher, composed of the initials of his name; amongst them are the following:

Vita D. Joannis Baptistæ ex archetypo Andræ Sartii, &c." A set of 18 middle sized prints, in which are included the frontispiece, the portrait of Andrea, two subjects from Francia Bigio, and four single figures, representing Justice, Faith, Hope, and Charity.

The "Last Supper," after the same painter, a large plate lengthways. Huber. Manuel des Arts.

CRUGER, or KRUGER, THEODORE, (also called Ver Crus by the Flemings, and Dalla Croce by the Italians,) an engraver, born about the year 1646, by some supposed to be the son of the last-mentioned Cruger. This artist, in 1710, was employed, with three others, to engrave the Florentine gallery. There are some other plates by him, etched and retouched with the graver, in a style which does not shew any great merit. We shall only notice the following works of this master :

A Portrait of Ludovicus Adimari, engraved from P. Dandini; a small plate.

A portrait of a gentleman, from P. Bordone, in the Florentine gallery, folio.

A portrait of a lady, from the same, in the same collection, folio.

A portrait of the wife of Giorgione, from a painting by that master in the same gallery, folio.

St. Francis at prayers, from Carlo Maratta. Huber. Strutt.

CRUGER, or KRUGER, MATTHIAS, brother to the elder Theodore. This artist engraved some plates from Guido and other masters, as well as from his own compositions. Strutt.

CRUGER, LOUIS. See KRUG.

CRUICKSHANK, WILLIAM, a distinguished anatomist, was born at Edinburgh in the year 1746. At the age of fourteen he was sent to the university in that city, and after studying some years there, he was removed to Glasgow. He was intended by his father for the church, and as he was very diligent, and forward in classical learning, he early employed a part of his leisure hours in teaching Greek and Latin to the younger students, and in that capacity was engaged in the family of provost Buchanan: shewing at length a stronger propensity to medicine than to theology, he was placed under the care of Mr. Moore, surgeon, at Glasgow. From Mr. Moore Mr. Cruickshank removed, in 1771, to London, where he was soon introduced, and made librarian to Dr. William Hunter, in which office he acquitted himself so well, that on the secession of Mr. Hewson, he became the assistant, and, in a little time, joint lecturer in anatomy, with the doctor. He had here full scope for his abilities, and as he was as diligent as he was skilful, he added largely to the beautiful collection of anatomical preparations with which the museum of Dr. Hunter was filled, particularly by his curious injections of the lymphatic vessels. The result of his acquirements in this branch of anatomy, which he cultivated with assiduity and success, he published in 1786, under the title of "The Anatomy of the Absorbent Vessels of the Human Body." In this work, which was re-published in 1790, he demonstrated the structure and situation of the valvular lymphatic absorbents. On the death of Dr. William Hunter, which happened in the year 1783, Mr. Cruickshank became partner in the lectures with the doctor's nephew, Dr. Baillie, and had with him the joint use of the museum, for the purpose of illustrating the lectures. The museum has since, agreeably to the direction of Dr. Hunter in his will, been sent to Glasgow. In 1795, Mr. Cruickshank communicated to the Royal Society an account of the regeneration of the nerves. The paper was printed in the Philosophical Transactions for that year. The same year he published a pamphlet on insensible perspiration; and in 1797, an account of appearances in the ovaria of rabbits, in different stages of pregnancy; but his fame rests upon, and is best supported by his anatomy of the absorbents, which continues to be considered as the most correct and valuable work

on the subject, now extant. He died on the 27th of June, 1800. Annals of Medicine, vol. v.

CRUISE, from the German *kruifs*, *a-crofs*, signifies to cross to-and-fro, to sail up and down within a certain space of the sea, called the *cruising* latitudes, in quest of vessels, or fleets of an enemy, &c.

CRUISERS, in the Navy, are small men of war, made use of to-and-fro in the Channel, and elsewhere, to secure our merchant-ships and vessels from the enemy's small frigates and privateers. They are generally such as sail well, and are commonly well manned; and, indeed, the safety of the trade in the Channel, and up and down the soundings, and other places, absolutely requires the constant keeping out of such ships at sea.

CRUIT, in Geography, is an island in the Atlantic ocean, near the West coast of the county of Donegal, Ireland, Long. 3° 10' W. Greenwich. Lat. 55° 2' N.

CRULAY, a small town of France, in the department of the Eure, 12 miles E. of Verneuil.

CRUMAU, or KRUMAU, or *Krumtow*, a town of Moravia, in the circle of Znaim; 16 miles N.N.E. of Znaim.

CRUMAU, or *Krumlaw*, a town of Bohemia, in the circle of Prachatitz, on the river Moldaw; 17 miles S.E. of Prachatitz, and 76 S. of Prague.

CRUMENA, from *κρυμνω*, *pendeo*, *I bang*, in Zoology, the name given by Cardan, and some others, to the purse or pouch which the opossum has under its belly, and into which it receives the young in time of danger.

Scaliger, supposing there might be other animals, as well as the opossum, to which nature might have given this sort of pouch, has erected a general distinction, under the name of *animalia crumentata*; but the opossum is the only species yet known to belong to this genus. The only instance that naturalists seem to afford us of a like provision of nature for the care of the young, is what is related of some of the fish kind. Oppian, in his *Halieutics*, mentions this property of receiving the young into the body, in time of danger, to be in the dog-fish, and in the squatina, and some others; and Tyson observes, that, in the anatomy of a female dog-fish, he saw two slits under the belly, closed up in their natural state, but easily distensible, so as to be capable of receiving the young fish; and that these went not into the womb, nor any other peculiar part, but only into the cavity of the abdomen.

The account given by Oppian is, that, in time of danger from a storm, or from any fish or prey pursuing the young fry, they go into the parent's belly. If, therefore, after this account of Tyson's, any young fish should ever be found loose in the cavity of the mother's belly, it will prove the truth of this passage in Oppian, which has been so much disputed. Phil. Transf. No. 239, p. 120.

CRUMENTATA, a term used by Julius Scaliger to express such animals as have a pouch or bag under their belly, into which young ones may be received in time of danger. See OPOSSUM.

CRUMHUBELL, a silver mine in Silesia, which produces galena and silver ore, was thought by some to be the most elevated above the sea of any known mine, but Sterzingen silver-mine in the Tyrol (elevated 7512 French feet) and some others, are still higher.

CRUMIRUM, in *Ancient Geography*, a town of Lower Pannonia.

CRUMLIN CANAL, sometimes, though improperly, called *Kevo Chapel* canal, (under which name it is shortly described in our article CANAL.) This canal, or water-level, in its general direction, is nearly west, with a bending course of two miles, in the county of Glamorgan in South Wales;

it is throughout about level with the highest tides, or 22 feet above low-water mark in the Bristol Channel; it commences within ten yards of the river Neath, at Trueman's-hall shipping staith, which is opposite to the commencement of the Neath canal at Giant's-grave-pill, and proceeds through Crumlin bog to Lan-y-wern colliery, whence a tram-road proceeds in a tunnel, half a mile into the hill, and there intersects the same great vein of run or bituminous coals, which Messrs. Smith and Co. are working at Lanfallet. This canal is about 26 feet wide at top, 14 at bottom, and 3 feet deep, and was cut under the direction of Mr. Thomas Dadford, senior, at the sole expence of Edward Elton, esq.; who, it is to be feared, is but slightly remunerated by the small trade thereon, for his heavy expences in the undertaking. Crumlin bog, of about 700 acres, was since drained by a company of leasers, under lord Vernon and the lords of Neath abbey estate, to whom the same belongs.

CRUMLIN-Water, a small river of the county of Antrim, Ireland, which rises in mount Devis, and falls into Lough-Neagh.

CRUMMEL-BOTTOM, or *Cranwell-Bottom* quarries; these are situate near the village of Ealand, in the West Riding of Yorkshire, and furnish great part of the excellent paving-stone which is now so generally used in the foot pavements in London, by means of the Calder and Hebble navigation, which passes close by them. (See *CANAL*.) This valuable stone, and the white or grey slate from the same quarries, are the produce of the fourth grit-stone rock, reckoning upwards from the mineral or Derbyshire lime stone strata. This rock is remarkable in every part of its course through the kingdom for its abundance of mica, in small plates, so disposed as to occasion the stone to split with the utmost ease and truth, almost as thin as we please. Near Halifax the same is quarried in such large slabs as to floor the largest kitchens with only four or six stones; and it also splits so readily and truly in other directions, that long beams are not unfrequently cleaved out of it, of which some very remarkable specimens are, or were very lately, to be seen opposite to the late sir William Staines's stone-wharf in Millbank-street, Westminster.

CRUMNOCK LAKE, or *Water*. in Cumberland, lies on the N.W. of Buttermere; it is about four miles long, and half a mile in breadth, has three small islands in it, one of which is a naked rock, the others are covered with wood. This lake is extremely deep and clear, and contains abundance of char fish, from six to eight ounces weight each. The Coker river is fed from this lake, which itself receives the waters of Buttermere, and Lowes-waters.

CRUMP ISLAND, a small island in the West Indies about a mile long, near the N.E. end of the island of Antigua. N. lat. 17° 14'. W. long. 61° 25'.

CRUNA DEL CONDE, a town of Spain, in Old Castile, on the Duero, near Aranda de Duero.

CRUNARAD, or *CRUMARAD*, a hill of the county of Donegal, Ireland, 2 miles N. of Killibegs. It has a remarkably sharp top, and is much higher than any of the hills eastward of it, which makes it an excellent mark for finding the entrance of Killibegs harbour. McKenzie.

CRUNI, in *Ancient Geography*, a town of Greece, in the Peloponnesus, placed by Strabo between Chalcis and Pyle. — Also, a river of the Peloponnesus, which is near the fore-mentioned town. — Also, a town of Lower Mælia, upon the Euxine sea, N.E. of Odesus, and W. of the Cape Petrias.

CRUOR of the Blood, is a term synonymous with *Craffamentum*.

CRUPEZIA, in *Antiquity*, wooden shoes, or clogs, worn by the Mesochori.

CRUPINA, in *Botany*, a name by which some authors call the *carduus stellatus*, or star thistle.

CRUPPER is used by some for the hind or round part, or rump of a horse, comprehended between the place of the saddle and the tail. See *HORSE*.

The word is formed from the French *crouppe*, which signifies the same. It denotes also a thong of leather put under a horse's tail, and fixed to the saddle, to prevent it from being thrown forward. See *SADDLE*.

CRURA CLITORIDIS, in *Anatomy*, a term synonymous with *corpora cavernosa clitoridis*.

CRURA Cerebelli, are two portions of medullary substance, forming the trunk of the arbor vitæ, and joining the upper and back part of the pons varolii. See *BRAIN*.

CRURA Cerebri, are two large processes of medullary matter, departing from the inferior surface of the cerebrum, to join the pons varolii at its anterior part, where they unite at an acute angle. They are called by Soemmering *processus medulle cerebri*. See *BRAIN*.

CRURA Diaphragmatis, two portions of muscle, arising from the bodies of the lumbar vertebræ, and fixed to the posterior part of the greater diaphragm. They constitute the lesser diaphragm. See *DIAPHRAGM*.

CRURA fornicis, in the brain. There are four of these, viz. two anterior, and two posterior. The former are distinct round medullary chords, arising separately in the anterior lobes of the brain, and uniting to form the pillar or body of the fornix: the posterior crura are thin, broad, and flat; and united by the medullary expansion, termed *trigonus* or *psalterium*. They run along the anterior part of the great hippocampus. See *BRAIN*.

CRURA penis, are the same as the corpora cavernosa of that part.

CRURÆUS, or *CRURALIS Musculus*, in *Myology*, derives its origin from the anterior rounded surface of the os femoris, and proceeds in a straight direction to the basis of the patella. It cannot be at all separated from the vastus internus, and for the most part is as intimately united to the vastus externus. These three muscles should indeed be included under one name and description. The cruralis will assist in extending the knee-joint.

CRURAL, in *Anatomy*, is a term applied to the vessels, &c. of the lower extremity; viz. to the femoral artery and vein. There is an *anterior crural nerve*, derived from the lambar nerves, which supplies the front of the thigh. See *NERVE*.

CRURAL Arch, is the space left under the lower border of the tendon of the external oblique muscle, where it passes from the spine of the ilium to the pubis. The broad insertion, which the tendon has into the angle and crista of the pubis, gives to this part a concave form, which justifies the appellation of crural arch. The space in question is completely filled by various parts, which are passing between the thigh and the pelvis. Its outer part contains the iliacus internus, and psoas magnus muscles; between which, on the anterior part, lies the anterior crural nerve. Next to these muscles, towards the inside, is the femoral artery; and its corresponding vein is still nearer to the pubis. The trunks of the lymphatics of the lower extremity enter the pelvis, about the femoral vessels; and there is frequently a large gland, or more than one, under the tendon.

CRUS, denotes all that part of the body which reaches from the buttocks to the toes; and is divided into thigh, leg, and foot.

CRUSA, in *Ancient Geography*, a town of Asia Minor, in the Ceramic gulf.

CRUSADES.

CRUSADES. See **CROISADES.**

CRUSÆI, a people of Macedonia, who inhabited the country called Crysis in Mygdonia.

CRUSCA, an Italian term, signifying *bran*, or what remains of meal after the flour has been sifted out. It is only in use among us to denote that celebrated academy called *Della Crusca*, established at Florence, for purifying and perfecting the Tuscan language.

The academy took its name from its office, and the end proposed by it, which is to refine the language, and, as it were, to separate it from the bran. Accordingly, its device is a sieve, and its motto, *Il piu bel fior ne coglie*; that is, *It gathers the finest flour thereof*.

In the hall or apartment where the academy meets, M. Monconis informs us, every thing bears allusion to the name and device: the seats are in form of a baker's basket; their backs like a shovel for moving of corn; the cushions of grey fatten in form of sacks, or wallets; and the branches, where the lights are placed, likewise resemble sacks.

The vocabulary *Della Crusca* is an excellent Italian dictionary, composed by this academy.

CRUSIUS, **GOTTLIEB LEBRECHT**, in *Biography*, a German engraver, born in the year 1730. He studied design some time at Leipzig, and made drawings for the booksellers. He afterwards began to engrave, and went to Paris to complete his studies. He then again established himself at Leipzig, where he was principally employed in decorating the publications of the day. He had a brother named Carl, who likewise engraved for books, and died in 1779. Heineken.

CRUSSEILLE, in *Geography*, a small town of France, in the department of Mont Blanc, formerly the duchy of Savoy; 9 miles N. of Annecy.

CRUSSER, in *Commerce*, a piece of coin in Germany, valued at about three farthings.

CRUSSOL, in *Geography*, a small town of France, in the department of the Ardeche, with an ancient castle; 9 miles S. of Tournon.

CRUST of the Earth, in *Geology, a term implying the rocks and strata which are within the reach of geological observation, by means of valleys, fissures, mines, &c. It seems more than probable, that the whole of this is composed of stratified matters, formed from aqueous depositions, since much dislocated and broken in some parts, and being very thick and assuming a crystalline structure in others. See **STRATA**.*

With some early writers, the term crust was applied only to the alluvial mixtures or mould, &c. which cover the strata in most instances.

CRUSTA LACTEA, a *Medical* term, applied to a species of itchy running scab, which appears in the face of infants one or two years of age: they are generally observed in infants at the breast, that have not yet cut their teeth. However, the disease sometimes also appears later, as it has been met with in children of four or six years of age; and indeed it is not a disease of infants alone, for it has also, though rarely, been observed in adults. Children that are liable to it, are mostly attacked with it as often as they cut a tooth. Instead of the diarrhoea and cough, which are the more ordinary attendants of teething, the eruption appears in these subjects; and again dries up when the tooth is cut, as then the irritation has ceased. See the article **ACHOR**.

This disease is not attended with fever: it always appears first in the face, on the cheeks, mouth, lips, and forehead, in small ulcers of the size of a lentil, which contain a pale yellow gelatinous fluid. These small ulcers soon burst, per-

haps as soon as the second day, and form a scab or crust, in colour resembling milk that has been dried down over the fire, from whence also the disease takes its name. In the small-pox a similar scab is produced; but it is not so thick, nor so often reproduced. In the crusta lactea the bottom of the pustule is reddish, and the detached pustules have a pale red margin, like those of the small-pox; but the eruption does not itch, and it soon breaks. When the scab has fallen off, another is soon produced. The pustules soon coalesce, occupy a large portion of the surface, sometimes also approach the eye, rendering the cornea dim; whilst the albuginea becomes inflamed, which produces intolerance of light; and the whole face becomes covered, as it were, with a mask of scabs. They frequently appear also upon the breast and belly, and at length even upon the extremities; but only in a sporadic manner. Sometimes the patients are at the same time affected with scrophulous tumours. Frequently this eruption is kept up, by the patients' rubbing and scratching; so that the disease still continues for a long time, in consequence of the perpetual irritation.

This eruption Mr. Wichman terms the genuine crusta lactea, from which he distinguishes two other species of eruptions of the face: namely, when it is more violent, the *crusta serpiginea*; and that of the worst kind, the *crusta serofulosa*. The crusta serpiginea, which seems to him to be a combination of the crusta lactea with some other dyscrasia, and perhaps is of a herpetic nature, occurs also without fever, in children that are in other respects in perfect health, and chiefly in infants at the breast; appearing first in the cheek, in the vicinity of the parotid gland, where it forms a scab, which gradually spreads upwards to the forehead, and even behind the ear: it seldom occurs after the infant has been weaned; and more frequently in those infants that are suckled by hired nurses, than those who receive suck from the mother. It soon occupies a larger extent of surface, sometimes one several inches in diameter, upon the cheek, and forms a small scab of a darker colour. It is never attended with small ulcers, but rather with miliar eruptions; though these are of a darker colour than usual, and soon break. The pustules in this disease discharge a great deal, and contain an acrid fluid, producing an intolerable itching, which is not found in the crusta lactea, unless when complicated. The disease does not yield to those remedies which are useful in the crusta lactea, but spreads, if it be left time to do so, into wet itching spots. Sometimes also it spreads over the face, frequently attacks the eye-lids, but not the ball of the eye; and often, on the other hand, it occupies the hairy scalp. Weaning does not remove it; and if proper remedies are not applied, it may continue for years, and exhaust the strength of the patient. The fluid which runs out produces redness and itching in the parts with which it comes into contact.

In general, those children who are corpulent, who eat immoderately, whose mothers are of a scrophulous constitution, and who are nourished with milk of a bad quality, are most liable to this disease. The predisposition of an infant to the disease may be known, when its face is proportionably too full, when yellowish-red or dark-red spots appear upon its cheeks, when its urine has a fetid smell, and when the infant is much inclined to rub its cheeks.

In these cases, the health of the mother or nurse should be carefully inquired into, and whether she has had the same disease in her infancy. The mother or nurse may drink a decoction of sarsaparilla, and take every morning and evening about ten grains of rhubarb and flowers of sulphur. The infant should take, every two or three days, a small table-spoonful of tincture of rhubarb; and the dose should

be increased, whenever it is colicive. But in the simple genuine *crusta lactea*, more antacids, especially lime-water and magnesia, are chiefly recommended. Antimonial and mercurial medicines may also be tried.

When the milk of the mother or nurse is not thought to possess the requisite qualities, or when she seems not to be perfectly healthy, the infant should immediately be weaned, or a better breast of milk be found for it. The child's pap should be made with stale bread crumb, boiled in a mixture of equal parts of milk and water, with the occasional addition of a little Venetian soap and sugar.

As a remedy in this disorder, some have greatly recommended the *vicia tricolor*.

CRUSTACEOUS ANIMALS, a class of creatures, chiefly of the aquatic kind, and which are distinguished by having the body enclosed in a semi-calcareous crust, consisting either of one very large, and a number of small pieces; or of a series of annulations, nearly of an equal size throughout. They respire by means of distinct gills like fishes; and, like insects, are provided with jaws, feelers at the mouth, and antennæ either two or four in number; the eyes in general two, or one apparently; and the feet numerous and articulated.

The French naturalists divide all crustaceous animals into two orders: *crustacés pédicelés*, and *crustacés sessilacoles*. The first of these are composed, for the most part, of the Linnæan canci, or the crab and lobster tribe, as already noticed under our article **CANCER**: the other includes his genera of Illus, oniscus, lepidisma, and monocinus; the whole of which are comprehended, in the system of that author, among the apterois tribe of insects. See articles **CANCER** and **ENTOMOLOGY**.

CRUSTULA, in *Medical Writers*, the same as *ecchy-mosis*, in the eye, being a descent of the blood from the arteries into the *tunica conjunctiva*, occasioned by a wound, stroke, &c.

CRUSTUMERIUM, in *Ancient Geography*, a town of Italy, in the country of the Sabines, situated on the eastern bank of the Tiber, a little to the north of Fidenæ. According to Cuvierius, the ruins of this town appeared, in his time, in a woody tract, a little to the east of Marcigliano Vecchio. Livy calls the hills in its neighbourhood "Montes Crustumini." This town was taken and destroyed by the Romans in the 4th year of Rome, and the inhabitants were removed to the capital.

CRUSTUMINUS AGER, a territory of Italy, so called by Piny. and placed in Etruria.

CRUSTUMIUM, a river of Italy, in Umbria, between Ariminus and Pisaurus.

CRUSY, in *Geography*, a small town of France, in the department of the Hérault; 9 miles S. of Saint Pons.

CRUTCHED, or **CROUCHED Friars**; so called from the figure of a crutch, or the letter T, which they bore on their cloaks upon the left shoulder. Having been instituted to attend upon the sick and the infirm, in hospitals adjoining to their convents, they adopted the crutch as their distinctive badge. St. Anthony of Egypt, the patriarch of the Eastern monks, was the patron saint of their mother house, or first establishment, which was founded near the city of Vienne in Dauphiné, about the latter end of the eleventh century. Hence the painters have been accustomed to represent the patriarch himself with this badge upon his shoulder. The Crutched friars had a convent and hospital in a street in London, which still bears their name; besides other establishments at Oxford, Colchester, Guildford, and Reigate.

CRUX, in *Entomology*. See **CARABUS**, **CASSIDA**, **CICADA**, **CIMEX**, **COCCINELLA**, **CURCULIO**, and **PHALÆNA**.

CRUX Herrings. See **HERRING**.

CRUX Haven, in *Geography*, a sea-port town of Germany, situated on the north coast of the duchy of Bremen, in the German ocean, between the mouths of the Elbe and the Weser. N. lat. 53° 56'. E. long. 8° 6'.

CRUYLIUS, or **CRUYL**, **LEVINUS**, in *Biography*, a designer and engraver, born in Gand about the year 1640. In 1667 we find him at Rome, having become an ecclesiastic. This artist etched, from his own designs, a considerable number of views of Rome, enriched with figures, and executed with great delicacy and spirit; and amongst others a set in 23 plates, 1665. We have likewise, by him, many drawings on vellum, which are designed upon a very small scale with incredible neatness and accuracy. Huber. Manuel des Arts.

CRUYS, in *Geography*, a small town of France, in the department of the Alps; 9 miles S.W. of Sisteron.

CRUYSFIORD, a bay on the coast of Norway; 20 miles S.W. of Bergen.

CRUYSHAGE, in *Ichthyology*, the name of a fish of the shark kind, the *SQUALUS Tiburo* of Gmelin, somewhat approaching to that strange fish, the *zygæna*, but much less monstrous, its head being only triangular, or something like the figure of a heart, whence Wilughby has named it *zygæna affinis capite triangulo*. The eyes are very small, and are placed as in the *zygæna*, at the sides of the head: the mouth is small and triangular, and placed a vast way below the end of the nose, and is furnished with three rows of very small teeth. See *SQUALUS Tiburo*.

CRUYS-HAUTHEM, in *Geography*, a small town of France, in the department of the Escaut, chief place of a canton, in the district of Gand, with a population of 5145 individuals. The canton itself contains 10 communes, upon a territorial extent of 85 kilometres, and 17,158 inhabitants.

CRUZ, **JUAN PANTOJA DE LA**, in *Biography*, a painter, born in Madrid in the year 1561. He was the scholar of Alonzo Sanchez Coello, whom he succeeded as painter of the chamber under king Philip II. Juan sometimes painted history, but his *forte* lay in portrait. He died in 1610.

Under this name, J. S. Müller, an English artist, has engraved two plates, intitled "Writing the Billet," and "Delivering the Billet." Heineken, however, considers them as no other than fictitious imitations of the Spanish style. Cumberland. Heineken.

CRUZ, **DE LA**, **DON JUAN**, and **DON MANUEL**, two artists, probably brothers, born at Madrid about the year 1750. In 1777, were published in that city a set of 12 folio plates, representing Spanish costume, designed by Don Manuel, and engraved by Don Juan. They are entitled, "Collection de Trajes de España, tanto antiguos como modernos." Huber. Manuel des Arts.

CRUZ, **ST.** See **St. CROIX**.

CRUZ, **Santa**, a port on the western coast of America, situated on the east coast of the gulf or bay of Bucarelli, the entrance of which is, according to the determination of La Pérouse, about W. long from Paris 136° 15', or, according to an observation of captain Cook, 227° E. of Greenwich, and N. lat., according to the plan of the Spaniards, 55° 15'. This gulf runs upwards of eight leagues inland, contains several large islands, and presents in its circumference 11 fine harbours, where ships may anchor with safety. Maurelle says, that he does not know a single port in all Europe that could be preferred to that of Santa Cruz. When Maurelle visited this port in 1779, he was soon visited by the Indians in its vicinity. Traffic commenced, the Indians exchanging

ing their furs and various trifles for glass-beads, pieces of old iron, &c. These Indians are of a clear olive colour, many of them having nevertheless a perfectly white skin. With a well-proportioned countenance, they are robust, courageous, arrogant, and warlike. Their clothes consist of the undressed skins of otters, sea-wolves, beaver (a species of deer), bears, and other animals taken in the chase. Several wear boots of smooth skins, laced up before; their hats, in the form of a cone, are woven from fine bark of trees; on their wrists they wear bracelets of copper, iron, or fins of whale; and round the neck, necklaces of fish-bone or copper. Their ear-rings are mother-of-pearl, or plates of copper, embossed with a topaz coloured rosin and jet beads. Their hair is long and thick, held together in a small queue by a comb, and tied with a narrow piece of coarse linen. The aspect of the women is pleasing, their colour fresh, their cheeks of a lively red, and their hair long and plaited. About the loins they tie a long robe of smooth skin, which covers them from the neck to the feet, and the sleeves reach down to the wrists. Over this gown they put skins of otters, or other animals, as a defence from the weather. All the married women have in their lower lip a large aperture, filled up by an oval piece of wood, the smallest diameter of which is about an inch; and its size is larger or smaller, as the person who wears it is older or younger. The girls only wear a copper needle, which crosses the lip in the part where the ornament is afterwards placed.

In war these Indians wear cuirasses and shoulder-pieces, resembling the whale-bone stays of Europeans; round the neck is a large coarse gorget, covering them up to the eyes; and on the head is a helmet, generally made of the head of some wild beast. From the waist to the foot they have a kind of apron, like the cuirass, formed of narrow boards tied together with threads, and thus rendered flexible. From the shoulder to the knee hangs a fine skin. With these arms they are invulnerable to their enemies. Their offensive weapons are arrows and bows, lances headed with iron, iron-knives longer than European bayonets, and small hatchets of silx or green stone, so hard as to cleave the closest wood without having its edge turned.

Their language is pronounced with great difficulty; and they speak from the throat with a motion of the tongue against the palate. Near the Port, where these Indians attend the market, they seem to be diligent and laborious; and they supply purchasers with a great variety of articles; such as well-woven stuffs, shaded with various colours, skins of otters, bears, &c.; well-woven coverlets of common cloth, and large ribbons of the same; skins of the seal, of which this cloth is made; wooden trenchers, curiously wrought; painted canoes; and a great variety of trinkets, of their own device and manufacture. They furnish the market also with great plenty and variety of fish, salmon, cod, perch, &c. The banks are lined with shells; and they use a great quantity of mother-of-pearl for ear-rings, but it did not appear to these voyagers whence they obtained it. Their food consists of fish, boiled or roasted, herbs and roots that are the produce of their mountains, and the flesh of animals taken in the chase. Maurelle was not able to ascertain whether they had any ideas or forms of religion: he observed, however, that they sometimes inclined their bodies towards the sun, but could not tell whether it was an act of devotion. In two islands he found three bodies laid in boxes, and decked in their furs, which were placed in a little hut, on a platform of the branches of trees.

Their country is hilly, the mountains very high, and their slope almost always extending to the sea. The soil, which is limestone, is covered with lofty pine-trees; and as they

are easily blown down, they rot and form a thick mould, in which are found nettles, camomile, wild celery, anise, elder, wormwood, sorrel, and many other plants.

They have ducks, mews, divers, kites, ravens, geese, cranes, gold-finches, and other small birds. These people are addicted to theft; and so eager were they for obtaining iron, cloth, and other stuffs, that they sold their children to procure them. The environs of this port are inhabited by different tribes inimical to each other. At the new and full moon the sea rises in the harbour of Santa Cruz to 17 feet 3 inches; and it is high-water at $\frac{1}{4}$ past 12 at noon. The lowest tides are 14 feet 3 inches; and the night tides exceeded those of the day by 1 foot 9 inches. *La Pérouse's Voyage*, vol. i.

CRUZ, Santa, a considerable town on the north coast of the island of Cuba, about 30 miles E. by N. of the Havana, and 115 N.W. by N. of Cadiz.—Also, the chief town of Cozumel island.

CRUZ, Santa, a town of Mexico, or New Spain, about 75 miles N. by E. of St. Salvadore, on the Pacific Ocean. It is situated on the gulf of Dulce, which communicates with the sea of Honduras.

CRUZ, Santa, De la Sierra, a province or bishopric of the vice-royalty of La Plata or Buenos Ayres in South America, in the audience of Chareas. This province is a government and captain generalship; and though its jurisdiction is of large extent, not many Spaniards are found in it; and the few towns are in general missions, comprehended only under the name of Paraguay missions. The missions belonging to the Jesuits, in the parts dependent on this bishopric, are those called *Indian Chiquitos*, which see. On this nation borders another of Pagan Indians, called *Chiriguanos*, which see. This province may be ranked among the warm regions beneath the chain of mountains; and trades in honey, sugar, and bees.

CRUZ, Santa, De la Sierra, the capital of the preceding government, lies 80 or 90 leagues E. of Plata. It was originally built somewhat farther toward the S.E. near the Cordillera of the Chiriguanos. It was founded in the year 1548, by captain Nuffo de Chaves, who called it Santa Cruz, from a town of that name near Truxillo in Spain, where he was born. But the city having been destroyed, it was rebuilt in the place where it now stands. It is neither large nor well built, nor has it any thing that entitles it to the title of a city. It may, indeed, be regarded rather as a military station than a regular town. It was erected into a bishopric in the year 1605. The chapter consists only of a bishop, dean, and archdeacon; having neither canons, prebendaries, nor other dignitaries. The usual residence of the bishop is in the city of *Masque-Pocona*, 80 leagues from Santa Cruz de la Sierra.

CRUZ, Santa, a town in the island of Teneriffe, the road of which was observed, in the "Embassy to China," to be $28^{\circ} 28' N.$ lat., and the longitude $16^{\circ} 26' W.$ of Greenwich; the variation of the compass was $17^{\circ} 35' W.$ of the pole; and the tide rose perpendicularly 6 feet. Several observations were made by *La Pérouse*, and his associates, at Santa Cruz, from which the N. lat. was fixed at $28^{\circ} 27' 30''$, and the longitude $18^{\circ} 36' 30'' W.$ from Paris. In this port English men of war do not salute, because the Spaniards are forbidden to make a return. Beef, mutton, pork, goats, poultry, fruits, and vegetables, are very good and reasonable; and for ships bound to the southward, and requiring refreshments, this place is preferable in many respects to Madeira, particularly as that wine is stronger and cheaper; a pipe, containing 120 gallons, not exceeding in price 10*l.* The town of Santa Cruz is pleasantly situated, and, though

not so crowded with inhabitants as Funchal, it is better laid out, more open, cleaner, and more comfortable. The well-built pier stretched out into the sea; the contrivances for safe and easy landing near it; the handsome almeyda, or mall, along the quay, shaded with several rows of trees; the fountain adorned with marble statues in the square, all apparently of late construction, denote a government attentive to the improvement of the place. The walks and rides in the neighbourhood of the town are more level and agreeable than those near Funchal in Madeira; and those who visited them found that they breathed a lighter purer air than usual, and felt, says sir G. Staunton, that they were in a fortunate island. The governor of the island resides at Santa Cruz; though the courts of justice are held at St. Chrolophe de Laguna, the capital of the island. All the stones of the beach, and all the ground and rocks in the neighbourhood of Santa Cruz, are manifestly volcanic. The buildings of both Santa Cruz and Laguna exhibited no trace of any other kind; and as no limestone is found in Teneriffe, the lime is supplied from the neighbouring islands.

CRUZADO, or CROISADE, an expedition to the Holy Land. See CROISADE.

CRUZADO, or *Cruzade*, in *Commerce*, is a Portuguese coin, struck under Alphonfus V. about the year 1457, at the time when pope Calixtus sent thither the bull for a croizade against the infidels.

It had its name from a cross, which it bears on one side; the arms of Portugal being on the other.

CRUZADO, *Bull of*, a bull published every two years in Spanish South America, and containing an absolution from past offences by the pope, and among other immunities, permission to eat several kinds of prohibited food, during Lent, and on meagre days; the monks employed in dispersing these bulls, extol their virtues with all the fervour of interested eloquence; the people, ignorant and credulous, listen with implicit assent; and every person in the Spanish colonies, of European, Creolian, or mixed race, purchases a bull, which is deemed essential to his salvation, at the rate set upon it by government; this price varies according to the rank of different persons. Servants, or slaves, pay the value of 1s.; other Spaniards pay 8 reals; and those in public office, 16 reals; the price has also varied at different periods. From the produce of this bull, there arises an annual revenue of 150,000 pesos.

CRUZINI. See CRUCCINI.

CRUZITA, in *Botany*, Linn. gen. 167. Schreb. 224. Willd. 259. J. fl. 85. Class and order, *tetrandria digynia*. Nat. ord. *Atriplices*, Juss.

Gen. Ch. *Cal.* Perianth four-leaved, permanent; leaves egg-shaped, concave; two inner ones with a very thin lacinated margin. *Braçtes* three, at the base of the calyx, permanent; anterior one linear, acute; lateral ones egg-shaped. *Cor.* none. *Stam.* Filaments four, capillary, a little shorter than the calyx; anthers small. *Pist.* Germ superior, egg-shaped, obtuse, compressed; style very short, two-parted; segments spreading; stigmas simple. *Peric.* none, except the diverging calyx, which falls off with the seed. *Seed* solitary, egg-shaped.

Ess. Ch. Calyx four-leaved, with three braçtes on the outside. Corolla none. Seed solitary, enclosed by the calyx.

Sp. C. *hispanica*. Loef. it. 203. *Stem* tall. *Leaves* opposite, lanceolate, quite entire. *Flowers* spiked, collected into a panicle. A native of South America, in the province of Cumana. The trivial name given to it by Linnæus is founded on a mistake.

CRUZY, in *Geography*, a small town of France, in the department of the Yonne, 9 miles north-east of Tonnerre.

CRY. See HUE, CLAMOR. HARO, &c.

CRYA, in *Ancient Geography*, a cape of Asia Minor, about the middle, and towards the north-west part of the gulf of Glaucus; this promontory was west-north-west of that of Telmissus.—Also, a fountain of Asia, in Cappadocia, near Cesarea.—And also, a town of Asia Minor, in Caria, according to Pliny; and in Lycia, according to Steph. Byz.

CRYASSA, or CRYASSUE, an ancient town of Asia Minor, in the northern part of the gulf of Glaucus, north of cape Crya, and north-west of the town of Telmissus.

CRYEON *INSULÆ*, three small islands, situated in the northern part of the gulf of Glaucus, one of the three is a rock, and Steph. Byz. calls the other two Carysis and Alina. He adds, that they belonged to the town of Crya.

CRYMNA, a town of Asia Minor, in Lycia, probably the same with the *Cremna* of Strabo.

CRYMODES, from *κρυος*, cold, in *Medical Writers*, a cold shivering fever, but often accompanied with an inflammation of the inner parts.

CRYNIS, in *Ancient Geography*, a river of Asia Minor, in Bithynia.

CRYON, a river of Asia Minor, which, according to Pliny, discharged itself into the Hermus.

CRYPSIS, in *Botany*, (from *κρυσις*, a concealment, the spike of flowers being concealed within the sheath of the leaf.) Hort. Kew. 1. 48. Schreb. 1710. Lam. Ill. 108. Vent. 2. 97. (Pallasia, Scop. hist. nat. 62. Antitragus, Gært. 507.) Class and order, *triandria digynia*; Lam. *Diandria*; Hort. Kew. Willd. Natural order, *gramina*.

Gen. Ch. *Cal.* Glume one-flowered, two-valved; valves oblong, lanceolate, flattish, somewhat unequal. *Cor.* Glume two-valved, longer than the calyx; valves lanceolate, awnless, somewhat unequal. *Stam.* Filaments three, often only two, capillary, longer than the corolla; anthers oblong. *Pist.* Germ superior, oblong; styles two, capillary; stigmas feathery. *Peric.* none; the corolla enclosing the seed. *Seed* solitary, egg shaped, acute.

Ess. Ch. Calyx two-valved, sessile, lanceolate. Corolla two-valved, longer than the corolla, awnless.

Sp. 1. C. *aculeata*. Hort. Kew. 1. 48. Mart. Lam. Ill. 856. tab. 42. fig. 2. Willd. Schoebæ Marocco, part 1. p. 22. (Schœnus aculeatus, Linn. Sp. Pl. 2. Anthoxanthum aculeatum, Linn. jun. Supp. Phleum aculeatum. Lam. Enc. Phleum schœnoides, Jacq. Aufl. 5. 29. App. tab. 7. Agrostis aculeata, Scop. Cam. n. 89. Antitragus aculeatus, Gært. 27. tab. 30. Pularis vaginiflora, Forsk. disc. 19. Gramen album capitulis aculeatis, Bauh. Pin. 7. Tneat. 108. Schench. gram. 85. Moris. hist. 5. 195. & 8. tab. 5. fig. 3. Gramen spicatum, spicis in capitulum foliatum congestis, Tourn. 517.) "Spikes capitate-hemispherical, smooth, surrounded by an involucre of two or three mucronate, rather prickly, sheathing leaves; stems branched." *Root* annual. *Stems* several, from four to seven inches high, diffuse jointed, leafy. *Leaves* from one to three inches long, a line and half broad, glaucous or whitish, very acute; sheaths short, smooth, striated. *Spikes* enveloped in the leaves of the involucre, which are longer than the spike, and finally become horizontal; glumes of the calyx a little shorter than those of the corolla; stamens two or three. A native of Spain, Italy, and the south of France, on dry sandy or rocky ground. 2. C. *schœnoides*. Lam. Ill. 855. tab. 42. fig. 1. Desfont. Atl. 1. 62. (Phleum schœnoides, Linn. Sp. Pl. 5. Lam. Enc. 5. Jac. coll. 1. 111. Cypsis

Crypsis aculeata β. Hort. Kew. Willd. *Gramen maritimum* *typhnum* brevis & crassiori spica; Schench. agroth. 86. Monti. gram. 50. fig. 35. good) "Spikes jevically egg-shaped, smooth, furrounded at the base by a foliaceous sheath; stems branched, procumbent." *Root* annual? *Stems* several, from six inches to a foot long, smooth, with eight or ten yellowish, slightly protuberant knots. *Leaves* from three to five inches long, a line and half broad, smaller in the upper part of the stem, a little glaucous; sheaths smooth, striated, shorter than the internodes; lower ones cylindrical, closely surrounding the stem; upper ones loose, swelling in the middle, somewhat compressed. *Spikes* at the summit of the stem and branches, and from the axils of the upper leaves, oval-oblong, obtuse, from four lines to half an inch long, or more, scarcely more than two lines broad, on very short peduncles, furrounded only at the base by the floral leaves; flowers numerous, from four to six together on pedicels scarcely half a line long; stamens two or three; style filiform, simple, the length of the stamens, terminated by the two stigmas. A native of Spain, Italy, and the south of France. Dr. Roth, in his supplementary remarks on Willdenow's edition of the *Species Plantarum*, has referred this plant to Schreber's new genus *spartina*, on account of its simple style; and has added to it *dactylis stricta* of Dr. Solander, in *Hortus Kewensis*, and of Dr. Smith, which is distinguished by the same character. But as this genus has not been taken up either by professor Martyn, in his greatly improved edition of *Milner's Dictionary*, nor by La Marck in his *Illustrations of the Encyclopædie*, nor by Willdenow, we have left the present plant where La Marck placed it. We have not been able to discover from what plant Schreber drew his natural character of *spartina*, which does not correspond in all points with that before us. Dr. Hort has likewise formed a new genus for this grass, which he calls *heleochloa*, adding to it *phleum alopecuriodes* of Mitterpaek; but has not ascribed to it a single style. La Marck also has not mentioned this remarkable particular in his description given in the *Encyclopædie*, though it is expressed in the figure, afterwards published with his *Illustrations*. See *Annals of Botany*, vol. i. p. 140, and p. 297.

CRYPSIS arenaria; Lam. III. See *PHALARIS arenaria*.

CRYPT, (*Martyrium, Confessio, Holy Hole*;) formed of κρυπτε, *abscendo, I hide*; whence κρυπτη, *crypta*; is a subterraneous vault or chapel, constructed under the high altar, or eastern end in most ancient cathedral, abbey, and collegiate churches, for preserving the bodies of martyrs, or other saints, and for the performance of divine worship. The primitive Christians, having been accustomed in the times of persecution to hold their religious assemblies in the catacombs, where these were to be met with, as at Rome, Naples, Nola, Lyons, &c. as we learn from Tertullian ad Scapulam, cap. 3, and from the decrees of the emperors and prefects against such assemblies, (Euseb. Hist. l. vii. c. 11. l. ix. c. 2.) affected, upon the ceasing of persecution, to build their churches over, or near to such sepulchres of the martyrs; and, in situations where these were not to be found, they fabricated subterraneous vaults, called crypts, (being quite distinct places from the common cœmeteries,) in which they deposited such remains of martyrs, or other saints as they could procure; and which they furnished with altars and other requisites for the stated worship. This appears from Gregory of Tours, an author of the sixth century, and from subsequent writers. In William Thorn, the monk of Canterbury, mention is made of a particular collect to be said in the service performed in the crypts. The crypt under St. Peter's Church of the Vatican at Rome, called the Confession of St. Peter, and Li-

min; Apollolorum, is provided with diverse altars, and also with priests to officiate at them; but it is prohibited, under pain of excommunication, as an inscription in the vault testifies, for any woman to enter into it, except on Whit-Monday, on which day it is equally unlawful for men to visit the place. See the crypts under Canterbury, York, and Winchester cathedrals, also under the churches of St. Grimbald at Oxford, Christ Church in Hampshire, Wimburn in Dorsetshire, Dorchester in Oxfordshire, now used as a bone house, &c. See likewise representations of the crypts of Grantham, Peterborough, Waverly, and Wells, in "Carter's Ancient Architecture of England," vol. i. plates lxxviii. lxxix. M.

S. Ciampini, describing the outside of the Vatican, speaks of the cryptæ of St. Andrew, St. Paul, &c. About two furlongs to the northward of Latikea or Laodicea in Syria, are several of these cryptæ or sepulchral chambers, hollowed in the rocky ground, some 10, others 20 or 30 feet square, but of low height, and never proportionable. A range of narrow cells, wide enough to receive one coffin, *sarcophagus*, or *κλινη*, and long enough sometimes for two or three, runs along the sides of most of these sepulchral chambers, and appears to be the only provision that was made, provided, indeed, they were only made for the reception of the dead. One of these cryptæ is held in great veneration by the Greeks; they call it "St. Teek'a," in commemoration of some acts of penance and mortification that are said to have been performed here by that first virgin martyr. In the middle of it there is a fountain, supposed to be instrumental in producing miraculous visions, and extraordinary cures. Here they bring diseased persons, and after having washed them with holy water, and perfumed them, they return confident of a speedy cure. Here likewise the aged and infirm pretend to receive warnings of their approaching dissolution, while the young are made to foresee a train of events that are to occur in the future course of their lives. The sepulchral chambers near Jebilce, Tortosa, and the Serpent fountain, together with those that are commonly called the "Royal Sepulchres at Jerusalem," all of which communicate with each other by narrow entrances, are of the like contrivance and workmanship with the cryptæ of Latikea; as were, probably, the cave of Machpelah, and the other sepulchres of the sons of Heth. (Gen. xxiii. 6.) Instead of those long narrow cells that are common in most of the other cryptæ; some of those at Jerusalem are single chambers, others have benches of stone, ranged one over another, upon which the coffins were to be placed. To these we may join the sepulchre where our Saviour was laid, which was also hewn out of the natural rock, (Matt. xxvii. 60.) and lay originally under ground like the others; but by St. Helena's cutting away the rock round about it, that the floor of it might be upon a level with the rest of the pavement of the church, it is now a grotto above ground, or curiously overlaid with marble. It consists of one chamber only, without cells, benches, or ornaments; being about seven feet square, and six high; and over the place where the body was laid has been erected, for many years, an oblong table of stone, or thorus, *κιβητιον*, 3 feet broad, and nearly of the same height, which serves the Latins for an altar. The low narrow door or entrance, where the stone was fixed and sealed, till rolled away by the angel, still continues to conduct us within it; and as this was not situated in the middle, but on the left hand, and as the grave where Christ was laid, may well be presumed to have been placed within it, on the right hand, or where the altar is at present, we may, from these circumstances, well account for Mary and John (John, xx. 5, 11.) being obliged

“to stoop down, before they could look into it.” The sepulchre of Lazarus was likewise of the same kind; as were the sepulchres of the prophets, as they are now called, with many other caves that are met with on the mount of Olives; which might, all of them, have either served, or have been originally designed for burying places, having their proper stones, or opercula, to lay upon them, or to shut them up. Shaw's Travels, p. 264, &c.

Vitruvius used the word *crypta* for a part of a building, answering nearly to our cellar; Juvenal, for a *cloaca*.

Hence *crypto-porticus*, a subterraneous place, arched, or vaulted; used as an under-work, or passage, in old walls. See *CRYPTO-porticus*.

The same is also used for the decoration at the entry of a grotto.

CRYPT is also used by some of our ancient writers for a chapel, or oratory under ground.

CRYPTA, in *Anatomy*; a name given to glands which are supposed to be of the most simple form; viz. such as consist of a simple bag, with a direct and short opening.

CRYPTANDRA, in *Botany*, (from *κρυπτός*, to cover or conceal, and *άνδρα*, a man, in allusion to the five scales which conceal the stamina), is a New Holland genus of plants, first established by the writer of this article in the 4th volume of the Linnæan Society's Transactions, p. 217. Class and order, *pentandria monogynia*. Nat. Ord. probably *Rhododendro* of Jussieu.

Gen. Ch. *Cal.* perianthium of five leaves, inferior, permanent, membranaceous. *Cor.* of one petal, much longer than the calyx, tubular or bell-shaped, externally pubescent, its margin in five regular and equal segments. Scales five, alternate with the segments of the corolla, and inserted at their base, vaulted, roundish. *Stam.* five, inserted into the tube of the corolla at its summit, under each of the scales; filaments very short; anthers roundish, vertical, beardless, of two cells. *Pist.* Germen superior, roundish, three-lobed; style simple, straight, as long as the tube of the corolla; stigma small, three cleft. *Peric.* Capsule of three valves and three cells, the partitions formed by the inflexed margins of the valves. *Seeds* solitary in each cell, roundish, compressed.

Ess. Cn. *Calyx* of five leaves. *Corolla* tubular; its limb five-cleft, with five vaulted scales between the segments. *Stamina* inserted into the top of the tube, under each scale. *Stigma* three-cleft. *Capsule* superior, of three valves, and three cells formed by the inflexed valves. *Seeds* solitary, compressed.

Species 1. *C. ericoides*. Leaves linear, acute. Corolla funnel-shaped, externally bristly. *Sm.* *MSS.* Stem shrubby, much branched, slender; the branches leafy, and clothed when young with silky hairs or bristles. Leaves a quarter of an inch long, fasciculated, opposite, smooth, linear, acute, keeled, on short stalks. Flowers in dense, leafy, terminal heads, apparently reddish, clothed externally with white, silky, close-pressed bristles. 2. *C. amara*. Leaves spatulate, obtuse. Corolla bell-shaped, externally hoary. *Sm.* *MSS.* Stem shrubby, of humble growth like the foregoing, being about three feet high, wand-like, beset with numerous, alternate, short, leafy branches, clothed with short starry pubescence. Leaves fasciculated and scattered, the length of the former, but spatulate, obtuse, entire, smooth, on short stalks. Flowers about the summits of the branches, clustered, with one or two straggling axillary ones, on very short stalks. Their colour seems to be internally reddish; their shape is campanulate and short, and they are clothed externally with close, white, hoary pubescence. *Calyx* brown. Every part of this

species is bitter, especially the leaves. The young twigs have the flavour of Peruvian bark, *Cinchona*, and it is much to be wished that the plant should be submitted to chemical and medical experiment. It flowers in May.

Both species of *Cryptandra* grow in the neighbourhood of Port Jackson, New South Wales, from whence Dr. White long ago sent dried specimens to Europe. We have not had any information of their introduction to the European gardens, but they both deserve cultivation for their elegance, having the aspect of *Erica*, or rather of some of the smaller kinds of *Daphne*. The flowers of the second species, being nearly closed, and therefore exhibiting only their white outside, look like little clusters of pearls, as has been remarked by those who have seen them growing wild. S.

CRYPTIA, *i. e.* the AMBUSCADE, in *Grecian Antiquity*, a cruel practice, subsisting among the Lacedæmonians, and by some ascribed to Lycurgus, of lessening the number of their slaves when they were thought to be too numerous. Such as had the care of the Spartan youth, selected the stoutest of them, and having armed them with daggers, sent them out to destroy their unhappy slaves, either by surprizing them in the night, or falling upon them in the day, when they were at their work, and defenceless. Plato (*de Legib. et de Republ.*) condemns this law; and Plutarch (*in Vit. Lycurg.*) denies that it was made by Lycurgus; whereas Aristotle expressly lays it to his charge; but whenever or however it was made, it was undoubtedly a cruel and unnecessary expedient, in all respects unworthy of a virtuous people. See HELOTES.

CRYPTOCEPHALUS, in *Entomology*, a genus of the Coleoptera tribe, the antennæ of which are filiform; feelers four in number; thorax margined; wing-cases emarginate, and the body sub-cylindrical. Gmelin. A number of the insects in this genus belong, in the Linnæan system, to the Chrysomela tribe, from which they have been separated by Fabricius, and other late writers. The Fabrician character of the genus *cryptocephalus* is taken principally from the structure of the mouth; according to this writer they have four filiform feelers; the jaw furnished with a single tooth, the lip horny and entire, and the antennæ filiform. Most of the species described by Gmelin in this genus, appeared in the first instance in the works of Fabricius.

Species.

LONGIPES. Dusky-black; wing-cases pale, with three black spots; fore legs long. Fabr. *Clytra longipes*, Laichart.

Found on the nut-tree in Germany. The antennæ are short, serrated, and black; dots on the wing-cases, disposed two in the middle, and one at the base; legs black.

3-PUNCTATUS. Blackish-blue; wing-cases testaceous with three black dots; anterior legs long. Fabr.

Described from a specimen in the museum of Dr. Allioni; it is nearly allied to the last but smaller, and inhabits Italy.

SALICIS. Black and polished; wing-cases red with three black dots. Fabr.

Found in Saxony, according to Hybner. The antennæ are black and short; head and thorax deep black, and without spots; wing-cases variable from red to testaceous; body black.

6-NOTATUS. Deep black; wing-cases testaceous, with two dots and line behind of black. Fabr.

A small species found in Barbary, and first observed by Fabricius in the cabinet of M. Desfontaines. The antennæ are

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are long; thorax black and immaculate; wing-cafes smooth; future black.

6-MACULATUS. Black, thorax red and immaculate, with three black dots. Fabr.

A native of Italy, in the cabinet of Dr. Allioni.

4-PUNCTATA. Black; wing-cafes reddish yellow, with two black dots; antennæ ferrated. Fabr. *Donov. Brit. Inf. Chryfomela.*

4-PUNCTATA. Linn. *Melontha, Geoffr.*

Found on the nut-tree in Europe.

4-NOTATUS. Blue-black; wing-cafes red with two blue-spots; antennæ short. Fabr.

Inhabits Barbary; legs black. Prof. Vahl.

LÆTUS. Green-bronzed; wing-cafes testaceous, with two black spots. Fabr.

Discovered by Hybner in Saxony. The head is green, and brassy; thorax brassy, with testaceous margin; wing-cafes smooth; body blackish, at the tip brassy; legs brassy, with the shanks testaceous.

ATRAPHAXIDES. Black; thorax red, with three black spots; wing-cafes testaceous, with three black spots; shanks rufous. Fabr. *Chryfomela atraphaxidis, Pallas.*

A native of Siberia, preserved in the Bankian cabinet. The antennæ are ferrated and cinereous; thorax rufous, with three contiguous spots at the base; legs rufous; thighs black.

LUNULATUS. Black, polished; wing-cafes yellow, with a black lunule band, and dot at the tip. Fabr.

Described from a specimen in the Bankian museum; the native place unknown; antennæ short and ferrated; body black.

12-MACULATUS. Black; thorax and wing-cafes red, with four black dots on each. Fabr.

Native of the Cape. The antennæ are short, ferrated, and reddish at the base; thorax rounded and smooth. Bankian Cabinet.

DORSALIS. Ferruginous; future black, near the tip ferruginous. Marsh. Ent. Brit.

A small species found in Britain.

MARGINELLUS. Black; margin of the head, thorax, and body, together with the legs, yellow. *Donov. Brit. Inf.* Discovered in Coombe wood, Surrey; rather larger than the last.

FRONTALIS. Deep-black and glossy; front, anterior part lateral; margin of the thorax, and wing-cafes, with the legs yellow. *Cryptocephalus frontalis, Marsh. Ent. Brit.*

OBSTITUS. Testaceous; antennæ and margin of the wing-cafes black. Fabr.

A native of America. The antennæ are ferrated, and black; abdomen cinereous fuscous.

LINEATUS. Reddish; thorax with two black spots; wing-cafes with two black lines. Fabr.

Described from the Bankian cabinet, as a native of the Brazils.

TRIDENTATUS. Blueish; wing-cafes testaceous; dot on the shoulder black. *Chryfomela tridentata, Linn.*

An European species found on the willow and poplar, and described by Fabricius in his *Suppl. Ent.* under the name of *elytra tridentata*.

TAXICORNIS. Blue; wing-cafes testaceous and immaculate; antennæ ferrated.

Inhabits Italy, Dr. Allioni. Very much resembles the last.

VENUSTUS. Grey brown; two spots on the thorax, and margin yellow; wing-cafes yellow with two black fillets.

Described by Fabricius from a specimen in the collection of Dr. Hunter, obtained from America.

GORTERIÆ. Black and glabrous; thorax and wing-cafes with four yellowish dots.

Inhabits the Cape of Good Hope. *Chryfomela Gorteriæ, Linn. Amœn. Acad.*

8-PUNCTATUS. Black; thorax rufous; wing-cafes testaceous, with four black dots. Naturf.

Found on plants in Barbary by professor Vahl.

MAXILLOSUS. Head and thorax fulvous; wing-cafes yellow, with a black dot at the base, scutell black.

A native of the Cape of Good Hope; in the Bankian Cabinet.

AURITUS. Deep-black, a yellowish spot on each side the thorax; shanks yellow. *Herbst. Chryfomela aurita, Linn.*

Found on the nut-tree in Saxony.

LENTISCI. Blue; wing-cafes blood-red, with rough blue spots. Fabr. *Chryfomela variolosa, Linn.*

Inhabits Africa, where it occurs on the lentiscus. *Muf. Desfontaines.*

DIDYMUS. Rufous, wing-cafes with three black spots, the anterior one double behind. Fabr. *Donov. Inf. New Holland.*

Discovered in New Holland by sir Joseph Banks.

4-MACULATUS. Rufous; head at the base, and two spots on the wing-cafes, blue. Fabr. *Chryfomela 4 maculata, Linn.*

A native of Germany, and feeds on the nut-tree.

FLAVICOLLIS. Black; thorax fulvous with six black dots; wing-cafes pale, with two dots. Fabr.

A Siberian insect, described from the Bankian cabinet.

LONGIMANUS. Dull-brassy; wing-cafes testaceous with a black dot at the base. Fabr. *Chryfomela longimana, Linn.*

Inhabits Sweden, on the trifolium montanum.

LAR. Rufous; wing-cafes fuscous glossed with blue; anterior legs elongated.

A native of South America. The wing-cafes striated with dots.

MARGINATUS. Brassy-black, with yellow wing-cafes; margin black. Fabr. *Cryptocephalus phaleratus, Act. Hall.*

Found on plants in Europe, chiefly Germany.

PUBESCENS. Thorax and elytra dull-brassy and pubescent. Fabr.

An American species. The body is entirely covered with cinereous down; scutell black.

2-PUNCTATUS. Black and polished; wing-cafes red, with two black dots; antennæ length of the body. *Geoffr. Chryfomela 2-punctata, Linn.*

This and the following species inhabit Europe, and feed on the nut tree.

LINEOLA. Deep-black and glossy; wing-cafes red; line in the middle black; antennæ length of the body.

2-MACULATUS. Deep-black; thorax fulvous; wing-cafes testaceous with two black dots. Fabr. *Chryfomela melanocephala, Act. Hall.*

Inhabits Italy, Dr. Allioni.

CORDIGER. Thorax variegated; wing-cafes red, with two black dots. *Geoffr.*

An European species, found on the nut and willow.

BOTHNICUS. Deep-black; a longitudinal red line on the thorax. Fabr. *Chryfomela botnica, Linn.*

A native of Sweden.

FRENATUS. Deep-black; head, thorax, and legs rufous; two black dots on the thorax. Fabr.

Found in Austria, and nearly allied to the former; head rufous, with the posterior margin black.

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OBSCURUS. Dusky-black; posterior legs elongated. Fabr. *Chryfomela obscura*, Linn. Mant.

An European species; feeds on various plants.

VITIS. Glossy-black; thorax globose; wing-cafes rufous. Geoffr.

A species extremely destructive to the vine in the south of Europe.

CORYLI. Black; thorax and wing-cafes testaceous; suture black. Fabr. *Chryfomela coryli*, Linn.

PLAGIOCEPHALUS. Black; thorax and wing-cafes testaceous; head thickish. Fabr.

Found in the south of France according to Schestdt. It bears some affinity with the species *coryli*, which also inhabits Europe. The antennæ are short, serrated, and black; head thick, prominent, and black; scutell black.

PALLENS. Black with cinereous hairs; thorax and wing-cafes pale. Fabr.

Described from a specimen received by Dr. Pflug, from China.

VARIEGATUS. Black; abbreviated dorsal line, and margin of the thorax red; wing-cafes testaceous. Fabr.

A native of Italy. Dr. Allioni. The head is black with a yellow dot between the antennæ; legs black.

TRIFASCIATUS. Above testaceous; band on the thorax, and three on the wing-cafes black. Fabr.

This, according to Dr. Pflug, is found in China; the head is black, with a large frontal testaceous spot, and the body black.

RUFICOLLIS. Black; thorax rufous; wing-cafes testaceous; anterior legs long; thighs armed with a single tooth at the tip. Fabr.

A specimen of this species found at St. Helen's is preserved in the Bankian cabinet; it has been also met with by professor Helwig in Italy. The antennæ are thick and much serrated; legs testaceous; thighs marked with a black line.

NIGRIFES. Head and thorax rufous; wing-cafes pale, legs black at the tip. Fabr.

A native of America. The antennæ are black with the base rufous.

6-PUNCTATUS. Black; thorax variegated; wing-cafes red with three black spots. Fabr. *Chryfomela 6-punctata*, Linn.

Inhabits plants in Europe.

COERULANS. Glossy-blue; antennæ fuscous. Fabr.

Described from an African specimen in the Bankian cabinet. The antennæ are short and serrated.

VIOLACEUS. Black-blue; antennæ and legs black; wing-cafes somewhat striated. Fabr.

Inhabits Germany. Same size as the last, but has the antennæ black, and not serrated.

CUPREUS. Glossy copper-red, beneath blue. Fabr.

Found in Cayenne, Von Rohr. The under surface is dusky.

RUBRIFRONS. Blue, and glossy; front with the band on the thorax, and the thighs red. Fabr.

Native place unknown. The antennæ are fuscous with the base rufous.

CALCARATUS. Violaceous; head, thorax and thighs dented and rufous. Fabr.

Inhabits Sierra Leona. Bankian cabinet.

LOBATUS. Dusky-blue, with the posterior shanks lobate at the tip. Fabr.

Found by Hübner in Hungary. It is of a middle size; the antennæ black, with the base testaceous: head and thorax blue; wing-cafes dusky.

RUFIPES. Blue or green, and glossy; legs rufous. Fabr.

Native of the Cape of Good Hope. Bankian cabinet.

CYANEUS. Blue, thorax and legs rufous. Fabr. *Melicentha*, Geoffr.

Found in France by Mallet.

CINCTUS. Head and thorax rufous; wing-cafes black; margin rufous. Fabr.

Described as a native of South America from a specimen in the Hunterian collection.

BUCEPHALUS. Blue, mouth, margin of the thorax, and the legs red. Fabr. *Chryfomela bucephala*, Aët. Hail.

Inhabits the *Anthyllis vulneraria* in Saxony.

COLLARIS. Blue, and glossy; sides of the thorax, tips of the wing-cafes, and the thighs red. Fabr.

Native of Siberia. The antennæ rufous at the base; body black; legs and thighs rufous.

SERICIFUS. Green-blue; antennæ black. Geoffr. *Chryfomela sericea*, Linn.

Found on the willow in Europe.

NITENS. Glossy-green; mouth and legs testaceous. Fabr. *Chryfomela nitens*, Linn.

An European insect, found on the nut tree.

GLABRATUS. Violaceous; thorax and wing-cafes brassy; antennæ fuscous. Fabr.

Inhabits Brasil. The antennæ are fuscous with the base ferruginous; wing-cafes smooth; beneath entirely violet.

LIMBATUS. Ferruginous with rufous thorax; suture of the wing-cafes glossy-blue. Fabr.

A native of Cayenne. Schulz.

NITIDULUS. Thorax polished brassy; wing-cafes blue; head, antennæ at the base, and the legs yellow. Fabr.

Found in the southern part of Russia. Boeber. The wing-cafes are somewhat punctated; body black.

LABIATUS. Black and glossy; mouth, legs, and antennæ at the base, yellowish. Fabr. *Chryfomela labiata*, Linn.

An European species, found most commonly on the rose.

VITTATUS. Black; margin of the wing-cafes, and abbreviated stripe yellow. Geoffr. and Schæff.

Found on graminiferous plants in the south of Europe.

FLAVILABRIS. Violaceous, and polished; mouth pubescent; antennæ and legs black. Fabr. *Cryptocephalus parvulus*, Mill.

Inhabits the alder in Saxony, Schaller. The wing-cafes are marked with dotted lines.

FLAVIPES. Black and polished; head and legs pale yellow. Fabr. *Cryptocephalus paracenthesis*, Schrank.

Found in Italy by Dr. Allioni.

FLAVIFRONS. Blue-black and polished, front and legs yellow. Fabr.

A native of Germany, about Kiel.

HÜBNERI. Black; head and wing-cafes at the tip, and the legs yellow. Fabr.

Found by Hübner in Germany.

MORAEI. Deep black; wing-cafes with two spots and margin yellow. Fabr. *Chryfomela moraei*, Linn. Schæff. &c.

An European species.

8-GUTTATUS. Deep-black, wing-cafes with four yellow spots. Fabr.

Met with on the ash in Saxony by Hübner.

15-GUTTATUS. Rufous; three spots on the thorax and six on the wing-cafes, yellow. Fabr.

Inhabits Brasil. The antennæ are black, with the base yellowish; anterior thighs marked with a yellow spot.

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10-PUNCTATUS. Thorax testaceous, with a black marginal stripe; wing-cafes yellow, with ten black dots. Fabr. *Chryfomela 10-maculata*, Linn. *Cryptocephalus hieroglyphicus*, Herbt.

Native of Europe. The head is testaceous, with the posterior margin black; legs yellow, with the thighs of the hinder legs black.

12-PUNCTATUS. Thorax fulvous, with two black dots; wing-cafes testaceous, with five black dots. Fabr.

Described as a native of Germany, from the cabinet of Loewenkiold.

HAEMORRHOIDALIS. Blue; tip of the wing-cafes and legs fulvous. Fabr.

Found in France, near Paris. Bosc.

2-PUSTULATUS. Deep-black; a rufous spot at the tip of the wing-cafes. Fabr. *Cryptocephalus poda*, Lach.

2-FASCIATUS. Rufous; two spots on the thorax, and two bands on the wing-cafes black. Fabr.

Native of Africa.

4-PUSTULATUS. Black; wing-cafes smooth, with two rufous spots. Fabr. *Chryfomela 4-pustulata*, Linn.

Inhabits Sweden.

NOTATUS. Black; wing-cafes striated with dots; band and spot at the tip testaceous. Fabr.

Found in America. Mus. Dr. Hunter.

HISTRIO. Black; thorax and wing-cafes varied with ferruginous; legs ferruginous, joints black. Fabr.

Native of Italy. The head is black; orbits rufous; thorax black, with ferruginous margin, and three abbreviated lines; wing-cafes punctured with ferruginous spots at the tip.

SCOPOLI. Black; thorax rufous; wing-cafes rufous, with two blue bands; legs black. Panz. *Chryfomela scopolina*, Linn.

Found in Germany, and the southern parts of Europe.

KOENIGII. Rufous, with two blueish spots on the wing-cafes. Fabr.

Discovered in Tranquebar by Dr. Koenig.

PARACENTHESIS. Wing-cafes yellow, with small line and three dots black. *Chryfomela paracenthesis*, Linn.

Feeds on the willow and alder in Europe.

HORDEI. Brassy, and polished; front coppery. Fabr. Inhabits Barbary. The antennæ are serrated and black; anterior legs elongated.

CONCOLOR. Brassy-green, and polished; antennæ yellowish at the base; front impressed. Fabr.

A native of Europe.

PINI. Testaceous; wing-cafes pale and irregularly punctured; antennæ fulvous. *Chryfomela pini*, Linn. Fn. Succ.

Inhabits the pine, and is chiefly found in Sweden.

RETICULATUS. Thorax and wing-cafes white, reticulated with testaceous. Fabr.

A native of Cayenne. The head is testaceous, with the orbits of the eyes white; thorax white, with four testaceous lines; breast black; abdomen and legs yellowish.

PUSILLUS. Thorax fulvous; wing-cafes striated, testaceous, and spotted with black. Fabr.

Half the size of *C. pini*. The head is fulvous; the antennæ pale; eyes black; wing-cafes with two dots at the base, and a black band behind; body black; legs pale.

MINUTUS. Thorax fulvous; wing-cafes striated, testaceous, and immaculate. Fabr.

Inhabits Germany, near Kiel.

GRACILIS. Deep-black; head and thorax fulvous; wing-cafes with a white marginal line and base. Fabr. Geoffr.

A small species. The antennæ black, with the base rufous; thorax rufous and immaculate; legs rufous.

PYGMAEUS. Deep-black and polished; wing-cafes testaceous; future black.

Found in France by Bosc. This insect is very small; the head is black, with the front yellow; thorax at the anterior margin and sides yellow; wing-cafes striated; body black; legs yellow.

BIGUTTATUS. Black; head, tips of the wing-cafes, and legs yellow. Gmel.

A native of Saxony.

CASSIMILIS. Blue-black; head with two yellow spots; antennæ and front legs yellow. Herbt., &c.

Inhabits Prussia, near Berlin.

ORNATUS. Black; head with a bilobate fulvous spot; thorax with a yellow line and margin. Herbt.

PEREGRINUS. Black, glabrous; head, thorax, and wing-cafes blue. Herbt.

Found in India.

LATICLAVUS. Black; head, thorax, and wing-cafes rufous; future and edge of the wing-cafes black; antennæ serrated. Fort. Nov. Inf.

VRIDANS. Green; wing-cafes margined. Lepech. It.

This and the two following are natives of Russia.

8-NOTATUS. Thorax and wing-cafes yellow, with four black dots on each. Lepech.

6-NOTATUS. Black; thorax edged with rufous; wing-cafes with two dots and four spots of black. Lepech.

MULLERI. Black, and downy; wing-cafes with two red dots. Müll.

A native of Denmark.

MUSCIFORMIS. Green-blue; thorax red with a blue spot; shanks ferruginous. Geoffr.

This, and the five succeeding species, are natives of France.

VIBEX. Black; wing-cafes striated, red with a black margin, and four spots. Geoffr.

PUNCTATUS. Blue with scattered punctures; shanks of the anterior legs ferruginous. Geoffr.

PARISINUS. Black, striated; legs rufous. Geoffr.

ERYTHROUS. Black, striated; thorax and legs red. Geoffr.

FULVUS. Head and thorax fulvous; wing-cafes pale. Geoffr.

FERRUGINOSUS. Black and polished; antennæ twice as long as the body; wing-cafes with a yellow spot at the tip. Schrank.

MULTICOLOR. Wing-cafes yellow with two scarlet bands. Hornft.

This is a native of Java. The thorax is red; abdomen black at the tip.

SUMATRANUS. Wing-cafes yellow with a chestnut spot in the middle. Hornft.

COFFEA. Thorax with a transverse groove; abdomen green; wing-cafes yellowish. Hornft.

Inhabits Bantam, on the coffee, the berries of which it resembles in size, and appearance, as well as colour.

ORIENTALIS. Yellow, thorax rufous with a transverse groove; wing-cafes black-blue. Hornft.

Inhabits the East.

BATAVIENSIS. Head, thorax, and wing-cafes, with the legs livid. Hornft.

Inhabits Java.

JAVANUS. Black; thorax, and wing-cafes red spotted with black; antennæ black, with the base rufous. Hornft.

Inhabits Java.

CYANOCEPHALUS. Head, margin of the thorax; shells, base

CRYPTOCEPHALUS.

bale and tip of the thighs violet; crown and thorax scarlet. Lefk.

FLAVIFRONS. Black, polished; front, mouth, legs, base of the antennæ and edge of the shells yellowish. Lefk.

FUSCATUS. Brown; head, thorax, and shells violet; the latter deeply punctured. Lefk.

CHROCEPHALUS. Black; head, antennæ, and wing-cafes yellow, the latter with four black dots and one at the tip. Lefk.

CHRYSOPUS. Black, glabrous; wing-cafes punctured in striæ; head, tips of the wing-cafes and legs yellow.

SUTURALIS. Black, glabrous; wing-cafes yellow, with black future, and fillet connected at the tip. Lefk.

The six preceding species are natives of Europe.

† *Cryptocephalus*, Gmelin.—*Cistela*, Fabr.

Lip bifid; Body oblong.

CERVINUS. Livid; legs fuscous. *Chrysomela cervina*, Linn.

Found on plants in Britain and other parts of Europe.

Donor. Brit. Inf.

CINEREUS. Livid; wing-cafes and legs brown. *Cistela cinerea*, Fabr.

Found in Germany, and considered by Helwig to be a variety or sexual difference of the other.

LIVIDUS. Livid; antennæ fuscous. *C. livida*, Fabr.

Described from a specimen in the Banksian cabinet taken at Terra del Fuego.

CERAMBOIDES. Black; thorax narrowed before; wing-cafes striated and testaceous. Herbst. *Mordella*, Geoffr.

Inhabits Europe, chiefly the northern parts.

LEPTUROIDES. Deep-black; thorax square; wing-cafes striated and testaceous. *Cistela rufitarfis*, Lefk Reis.

Found in the south of Europe.

TESTACEUS. Black; thorax, wing-cafes, and abdomen testaceous. *Cistela testacea*, Fabr.

Inhabits Barbary, on the chrysanthemum.

PICIFES. Black; thorax square; wing-cafes testaceous; antennæ and shanks pitchy.

Found on plants in Denmark. Schæstedt.

SULPHUREUS. Yellow; wing-cafes sulphureous. *Chrysomela sulphurea*, Linn. *Tenebrio lutea*, Geoffr.

Feeds on umbelliferous plants, in Europe.

RUFICOLLIS. Deep-black; thorax ferruginous; wing-cafes striated. Fabr.

Inhabits southern Europe.

BICOLOR. Black; wing-cafes and legs sulphureous.

A native of Germany.

CARULEUS. Black; wing-cafes striated and blueish.

Found on plants in Barbary, by professor Vahl.

NIGRIPENNIS. Ferruginous; head, and striated wing-cafes black. Fabr.

Inhabits the south of France.

ANALIS. Reddish; antennæ, spot on the wing-cafes, and the tail, black. Fabr.

The spot on the wing-cafes is situated at the base, and in some specimens there are two spots on each wing-cafe, one at the base, the other at the tip.

Found by Dr. Koenig at Tranquebar.

RUFIPES. Black; wing-cafes smooth; antennæ and legs ferruginous. Fabr.

A native of Germany.

FULVIPES. Black; wing-cafes striated; legs ferruginous. Fabr.

Inhabits same country as the preceding.

VARIANS. Griseous; eyes black; wing-cafes somewhat striated. Fabr.

Inhabits Saxony, and is rather smaller than the following species.

MURINUS. Black; wing-cafes striated, and with the legs testaceous. Herbst. *Chrysomela murina*, Linn.

FERRUGINEUS. Testaceous; head and thorax fuscous; wing-cafes striated. *Cistela ferruginea*, Fabr.

THORACICUS. Fuscous; thorax and legs ferruginous; wing-cafes smooth. *Cistela thoracica*, Fabr.

Inhabits Saxony. Hybner.

FLAVIPES. Black; wing-cafes dusky, with a yellow spot at the base; base of the abdomen, and legs yellow. Fabr.

Described from the Banksian cabinet; the native place unknown.

EVONYMI. Testaceous; abdomen greyish; wing-cafes smooth.

Inhabits Germany, on the evonymus.

HUMERALIS. Black; dot at the base of the antennæ ferruginous. Fabr.

Found by Hybner in Saxony.

MAURUS. Black; wing-cafes substriated; base of the antennæ and legs ferruginous. *Cistela maura*, Fabr.

PALLIPES. Black and polished; base of the antennæ, and legs pale. Fabr.

A native of Germany.

MORIO. Black, dusky; legs testaceous. Fabr. *Cistela gibbosa*, Thunberg.

Found in Sweden, Paykull.

ANGUSTATUS. Thorax and wing-cafes dull-rufous, in the middle black. *Cistela angustata*, Fabr.

Inhabits Britain. The head is black; antennæ brown; legs ferruginous.

PALLIDUS. Pale; head and tips of the wing-cafes brown. *Cistela pallida*, Fabr.

Found in Britain.

AERUGINEUS. Yellow; head and breast black; wing-cafes greenish. *Cistela aeruginea*, Fabr.

An African insect; met with on the flowers of the aescynonema, to which it is extremely destructive.

FESTIVUS. Ferruginous; wing-cafes blue-green, with ferruginous margin. *Cistela festiva*, Fabr.

Inhabits the Cape of Good Hope.

ALVICUS. Black; thorax rufous; wing-cafes blue. Fabr.

Found in the same country as the preceding; the segments of the abdomen are rufous at the edges.

SVITTATA. Testaceous; margin of the wing-cafes, and stripe in the middle black. Fabr.

A native of Carolina, in the cabinet of Monf. .

HIRTUS. Hairy; head and thorax rufous; wing-cafes blue. *Cistela hirta*, Fabr.

Inhabits the Cape of Good Hope.

PUBESCENS. Pubescent, grey; head and abdomen fuscous. Fabr.

Found in Denmark. The antennæ are ferruginous at the base; future of the wing-cafes blackish; body dark; legs grey.

SEX-LINEATUS. Ferruginous; wing-cafes yellow, with three small black yellow lines. *Cistela sex-lineata*, Fabr.

Described from the Banksian cabinet; native place unknown.

ALPINUS. Black, polished; wing-cafes chestnut, and wrinkled, with the future black. Moll.

Inhabits Alpine parts of Europe.

STRIGOSUS. Reddish; abdomen black; front with two, thorax three, and wing-cafes four black bands. Sulz.

This,

This, and the eleven succeeding species, are found in Europe.

FORSTERI. Subvillous, brown, with longitudinal interrupted blackish bands. Schæff.

PUSTULATUS. Black, oval; wing-cafes with a rufous waved spot. Forst. Nov. Inf.

DENIGRATUS. Entirely shining black. Forst.

4-FASCIATUS. Sub-oval; black; with striated wing-cafes. Forst.

HOLOSERICUS. Oval; brown-green; wing-cafes with longitudinal interrupted dusky bands. Forst.

CAPUCINUS. Ferruginous; head, thorax, and wing-cafes brown, the latter with crenated striæ; antennæ and legs ferruginous. Muf. Lefk.

CONSPERSUS. Above covered with yellowish dust, beneath sprinkled with silvery; antennæ brown; legs rusty brown. Lefk.

SULPHURATUS. Brown; antennæ, legs, and shells fulphur; ends of the legs brown. Lefk.

TRUNCATUS. Brown; wing-cafes smooth; antennæ and legs reddish yellow; thorax truncated behind. Lefk.

BRUNNEUS. Brown; abdomen dark brown; wing-cafes smooth. Lefk.

RUFITARSIS. Oblong; head, body, antennæ, and legs, brassy-black and hairy; wing-cafes testaceous, punctured; tarsi rufous. Lefk.

Inhabits near Luface.

Cryptocephalus, Gmel. *Crioceris*, Fabr.

BITUBERCULATUS. Fulvous; wing-cafes pale, furnished with a fulvous margin. *C. tuberculata*, Fabr.

A native of Africa. Bankian Cabinet.

BIDENTATUS. Yellow; wing-cafes black; with the tip reddish. Same country and cabinet as the preceding.

MELANOCEPHALUS. Rufous; head black; wing-cafes violet.

A native of New Holland. Antennæ black; feet rufous.

LUNULUS. Black; thorax pale; lunule, on the wing-cafes, margin and two bands pale.

Inhabits Cayenne. Antennæ black in the middle; body black; abdomen and legs pale.

OCHRACEUS. Testaceous; dot on the thorax and abdomen black; tail fulvous. Herbst.

OCHREATUS. Testaceous; breast and shanks black.

Found in Guadaloupe.

LAPPONICUS. Black; margin of the wing-cafes, antennæ, and legs yellow.

Inhabits Lapland, on the birch.

NIGRITUS. Ferruginous; antennæ, breast, and base of the abdomen black; thorax cylindrical, impressed each side.

Native of Germany.

NIGRIPES. Thorax cylindrical, yellow; antennæ, breast, and legs black.

Inhabits New Holland; the antennæ black.

OCULATUS. Thorax cylindrical, yellow; wing-cafes black at the base, with a yellow dot.

Inhabits the same country as the last; the antennæ are yellow, and as long as the body; wing-cafes slightly striated; breast and thighs black.

MELANOPUS. Blue; thorax and legs rufous. Sulz.

A native of Europe.

VIOLACEUS. Black-violet; wing-cafes striated.

Inhabits near Paris; body oblong and flat.

EQUESTRIS. Head and thorax testaceous; wing-cafes reddish-brown, with the margin, line at the base, and band in the middle yellow.

A native of Cayenne; antennæ and legs yellowish; body black.

4-MACULATUS. Thorax rufous; wing-cafes testaceous, with two black spots.

Found in the southern parts of Germany. The head is black; antennæ testaceous; abdomen black; breast and legs testaceous.

PARVUS. Brown; two spots on the head; antennæ fulvous at the base.

Discovered in the vicinity of Berlin. Herbst.

TRISTIS. Black; wing-cafes blue, with striæ of punctures; legs fulvous.

Native of Austria. Herbst.

TRICOLOR. Black; thorax cylindrical, gibbous at the sides; head, future, and margin of the wing-cafes ferruginous; wing-cafes testaceous; legs, antennæ and feelers reddish-yellow. Lefk.

GIBBUS. Thorax cylindrical, gibbous at the sides; head, thorax, and legs reddish-yellow; wing-cafes black, and deeply punctured.

A native of Europe.

OCHROPUS. Black; wing-cafes brown; thorax, base of the antennæ, and legs yellow; thighs brown at the base. Lefk.

Inhabits Europe.

AQUATICUS. Black; thorax spotted; margin, broad suture of the wing-cafes, and the legs yellow. Müll.

Inhabits Denmark.

Besides the above, Gmelin includes in his genus *cryptocephalus*, the three Fabrician genera *erotylus*, *logria*, and *dryops*; which see respectively.

CRYPTOGAMIA, in *Botany*, (from *κρυπτος*, *secret* or *hidden*, and *γαμος*, *marriage*.) the twenty-fourth and last class of the sexual system of Linnæus, formed for several very numerous families of plants, in which the parts essential to their fructification have not been sufficiently ascertained, or are too small to admit of their being accurately described and referred to any of the preceding classes. It is divided by Linnæus into four orders, Filices, Musci, Algæ and Fungi. See those words. The order Hepaticæ has been added since. Mr. Kirwan, and some other geological writers, have maintained, that plants of this class and of the culmiferous kind are frequently found on the bituminous shales, which alternate with coal, but the whole of such vegetable remains seem, when minutely examined, to belong to no known genera, but to belong to the *incognita* of a former vegetable race, probably sub-aqueous. See **COLLIERY**.

CRYPTOGRAPHY, the art of secret writing, or writing in cipher. See **CIPHER** and **DECIPHERING**.

The word is compounded of *κρυπτω*, *I hide*; and *γραφω*, *I describe*.

CRYPTO-PORTICUS. This word, taken etymologically, means a dark subterraneous gallery; see the article **CRYPT**.

If we were to judge (says Winckelman) by the remains of antique edifices, and particularly by those of the Villa Adriana at Tivoli, we might be led to believe that the ancients preferred darkness to light; for in fact we find scarcely any chamber or vault among these ruined edifices which has any appearance of windows. It seems probable that in some the light was only admitted through an opening in the middle of the vault, but as the vaults are generally fallen this point cannot be ascertained.

The inhabitants of Italy were naturally attached to the shade

shade and coolness of half-lighted apartments, the long galleries of the Villa Adriana, which were undoubtedly *crypto-porticoes*, receive a feeble light at each end from embrasures near the ceiling.

The term *crypto-porticus* appears, however, to have acquired a more extended meaning than might have been inferred from its etymology, and in fact to have had the same meaning as our word gallery; thus Pliny, describing the *crypto-porticus* of his house of Laurentum, which he says partakes of the beauty and grandeur of public works, mentions windows on each side looking towards the sea and upon the garden, as well as a smaller number placed above the others. In warm and serene weather they were all opened, but otherwise they were only opened on that side which was sheltered from the wind. See GALLERY.

CRYPTOSTOMUM, in *Botany*, (from *κρυπτός* *hidien*, and *στομαχ*, the *moult*.) Schreb. 344. Willd. 390. (Montabea: Juss. 420. Aubl. 274.) Class and order, *pentandria monogynia*. Nat. Ord. undetermined.

Gen. Ch. *Cal.* Perianth one-leaved, funnel-shaped, swollen at the base, coloured with a five-cleft border; segments lanceolate, acute, unequal. *Cor.* Monopetalous, funnel-shaped; tube very short, inserted into the throat of the calyx; border five-cleft; segments lanceolate, acute, unequal, converging. *Nectary* broad, arched, five-toothed, adnate to the base of the corolla and closing its mouth. *Stam.* Filaments none; anthers five, each of them attached to one of the teeth of the nectary. *Pistl.* Germ roundish, in the bottom of the calyx; style cylindrical, the length of the calyx; stigma capitate. *Per.* Berry dry, globular, three-celled. *Seeds* one in each cell, egg-shaped, acute, marked with a large hilum or scar.

Eff. Ch. Corolla funnel-shaped, inserted into the calyx. Nectary one-leaved, closing the corolla. Berry dry, three-celled, with one seed in each cell. Obs. Jussieu calls the nectary a five-toothed filament.

Sp. C. *laurifolium*. (C. guianense; Gmel. Montabea Aubl. guian. 2. 680.) A bushy shrub. *Stems* several, five or six feet high or more, branched. *Leaves* alternate, nearly sessile, elliptical, entire, acuminate, smooth. *Flowers* white, four or five in a cluster on a short axillary peduncle, sweet-scented. *Berries* yellow. *Seeds* resembling an almond, eaten by the Creoles. A native of Cayenne and Guiana.

CRYPTUS, in *Ancient Geography*, a port of Arabia Felix, placed in the strait of the Persian gulf.

CRYSTAL, **CRYSTALLIZATION**, or **CRYSTALLOGRAPHY**, in *Chemistry*. The Greeks called ice crystal, (*κρυσταλλος*;) from the remarkable facility with which it liquefies. By the Roman naturalists the same term was afterwards applied to the substance at present named rock-crystal, because, from its colourless transparency, and from its being procured among the Alps and other cold mountainous regions, it was supposed to differ from common ice only in being more indurated by long-continued frost, and therefore more permanent. But the symmetrical figure of rock-crystal, consisting of a six-sided prism terminated by six-sided pyramidal summits, is equally remarkable as its lustre and transparency; and as soon as it was observed that nitre and certain other salts were also capable, by particular management, of exhibiting a similar prismatic form, the word crystal assumed a more general meaning, and was applied to all those regular polyhedral transparent solids which are presented to our notice by nature or art. In this sense the word is employed by the old chemists, and the crystalline form was considered as peculiarly characteristic of saline substances. By degrees it was found that the same tendency to symmetrical arrange-

ment, which had been noticed in the class of salts, obtained also in many of the metallic ores, and in a variety of other bodies belonging to the mineral kingdom; and at length some able naturalists and chemists began to be of opinion that, with the exception of matter in the state of vegetable or animal organization, every solid substance in nature was capable of being crystallized.

All compound bodies may be considered as made up of *integrant* particles, each of which is again composed of *elementary* ones. Thus a mass of common salt consists of a vast multitude of little cubes, which are its integrant particles, each of which is resolvable into muriatic acid and soda, which are its elementary ones. With the latter of these crystallization has nothing to do, nor is it possible to ascertain their forms, since they are not decomposable by means which have any relation to form. Thus, when a piece of common salt is pounded in a mortar, the concussions that it receives are continually destroying the adhesion between its integrant particles; and though it is incapable of being actually and completely resolved, on account of the comparative coarseness of the instruments that we are obliged to make use of, yet we see an evident approximation to this. Now a body, that is mechanically divisible, must be produced by the adhesion or aggregation of its constituent particles, and these, both with regard to their forms and the manner in which they adhere to each other, are proper objects of measurement and mathematical calculation. The case, however, is widely different with regard to the elementary particles of which the integrant molecules are composed; these are incapable of being in the smallest degree separated by percussion or mechanical force, and therefore the mode of their combination is not capable of being explained by geometrical calculation.

It has been the practice of some late authors to extend the meaning of the term crystallization so as to make it synonymous with the attraction of aggregation; this, however, appears to be injudicious; the latter comprehends every species of formation by which solids are produced, but the former expresses only that regular arrangement of homogeneous integrant particles by which, when interrupted, crystalline lamina, and, when uninterrupted, entire crystals are produced; aggregation therefore includes crystallization, which is only a mode or species of the former. It is of importance to bear in mind that not only a regular external figure, but a regular internal structure, is necessary to constitute a crystal, otherwise a column of basalt might be considered as a prismatic crystal, an error which some of the older mineralogists have actually fallen into.

Hardly any of the crystallizations that are performed by nature have been imitated by art: in return, however, chemistry has been able to effect the crystallization of a variety of substances, chiefly salts, which are not found crystallized naturally; and by taking proper advantage of this circumstance, has succeeded in obtaining them in a state of greater purity than any other method could afford them.

All substances, in order to be crystallized, require that their integrant molecules should be separated from each other by the intervention of a medium, in which they may move freely, according to the attraction of their crystalline polarity. But this necessarily implies two distinct operations; for the same attraction exerted by the medium, or solvent to overcome the attraction of a body, and reduce it to its integrant molecules, will also prevent the efficacy of its crystalline polarity. It is necessary, therefore, after having destroyed the aggregation of a solid by the requisite quantity of a solvent, to abstract by degrees such a portion of it, that the attraction of the remainder shall be inferior to the

the crystalline polarity of the substance dissolved. The simplest solvent that can be employed is caloric, and many great advantages attend its exclusive use. A number of cases, however, occur, in which its application is impossible, except in combination with some liquid menstruum, as water or alcohol.

Solids that are easily volatilized, without decomposition, at a moderate temperature, may be obtained in a crystalline state by gradual sublimation in close vessels. Thus, when grey oxyd of arsenic is exposed to a low red heat, the aggregation of its integrant molecules is destroyed, and it is converted into a vapour, which at the same, or any higher temperature, would continue in a permanently elastic state. This is the first part of the process, namely, the separation from each other of the integrant particles of the arsenic, in consequence of the addition of caloric, which interposes itself between them. The second part of the process, or the formation of crystals, depends on the tendency to an equilibrium, by which heat is characterized, and its being able to pass with readiness through media that are impervious by other bodies. When, therefore, the vapour, consisting of caloric and oxyd of arsenic, arrives in the upper part of the vessel, the caloric passes through, like water through a filter, while the oxyd of arsenic is left behind; this latter, therefore, is continually increasing in proportion to the remaining caloric, till the crystalline polarity of the particles of arsenic becomes superior to the attraction of the caloric. As soon as this takes place, a stratum of particles begins to be deposited on the inner surface of the containing vessel, and these serve as a basis, to which all the succeeding ones attach themselves, according to their peculiar mode of arrangement, in proportion as their crystalline attraction becomes superior to the affinity exerted by the caloric. In this way not only are volatilizable substances, when unmixed with others, obtainable in a pure crystalline state, but they may often be separated hereby from intimate mixture or combination with bodies of greater fixity. Thus, benzoic acid is separable in a crystalline form from the resin with which it is naturally combined, by taking advantage of its ready volatility at a moderate heat: thus, also, the manufacturers of sal-ammoniac separate this salt from sulphat of soda, and procure it of a crystalline texture by the application of a heat sufficient to sublime the former, while it has no such action on the latter.

Bodies may be made to assume the crystalline state, not only by the process of sublimation, but in many cases by a temperature only sufficient to fuse them. Thus, if we melt in a crucible a quantity of bismuth, or antimony, or sulphur, and afterwards cool it as slowly as possible, till a thin crust has formed on the surface, and then, by means of a pointed iron, pierce two small opposite apertures through the crust, and quickly pour out by one the still fluid portion while the air enters by the other, there will appear, on removing the upper crust, by means of a chisel, a cup-shaped hollow, studded with crystals, which will be more or less perfect, according to the magnitude of the original mass, the slowness with which it has been cooled, and the dexterity with which the fluid part has been evacuated.

There are, however, but few chemical substances, comparatively, that can be obtained in a crystalline state by the agency of heat alone; for some are decomposable by fire, and others are either infusible, or require such a high temperature for this purpose, as to make its application exceedingly troublesome and inconvenient. In effecting the crystallization of nearly the whole of the compound salts, and a few other bodies, recourse has been principally had

to the agency of water and alcohol, as these two fluids exert a considerable solvent power on the substances exposed to their action, without however decomposing them; and being themselves readily volatile, at a moderate temperature, they may be abstracted with sufficient slowness to allow the substances held by them in solution to be deposited in a crystalline form.

When a mass of salt (nitre for example) is immersed in water of the common temperature, the cohesive attraction of its particles is opposed by the solvent power or chemical attraction of the water. At first the nitre, being surrounded on all sides by particles of uncombined water, begins to be rapidly dissolved; but as the solution proceeds, this effect becomes more and more languid, till at length it entirely ceases; when the number of uncombined particles of water is so far reduced, that the sum of the solvent forces of those that are in contact with the nitre exactly counterbalances the attraction of cohesion, by which the undissolved residue of the nitre is held together. When this state of equilibrium takes place, the solution is said to be saturated; but although this is the case, as long as it undergoes no increase of temperature, yet, in proportion as the heat of the water is raised, the solvent power of the liquid is greatly augmented. The salt therefore that is contained in boiling hot water, may be considered as rendered fluid by the combined action of the heat and the water; and if this menstruum is completely saturated, it is manifest, that in proportion as it cools, the cohesive attraction between the particles of nitre will gain the ascendancy, and continue to act till the opposing forces find themselves again in equilibrium. All salts, therefore, which are more soluble in hot than in cold water, are in part deposited from a saturated solution by mere cooling, and if this is done gradually, and without the interference of any materially disturbing cause, the particles, as they consolidate, will arrange themselves in regular crystals.

When a solution of this kind has deposited by cooling all the saline particles which it was enabled to hold by its increased temperature, in addition to those which were retained by the mere action of the water, it is obvious that recourse must be had to the abstraction of the liquid menstruum itself, if we wish to procure from it any additional crystals. We therefore subject the whole to a boiling heat, which has the double advantage of driving off part of the water, and enabling the remainder, in consequence of the increased temperature, still to hold the salt in solution. When the evaporation has proceeded some time, a saline pellicle begins to appear on the surface of the liquor, which is a proof that the cohesive attraction of the particles of salt is obtaining a superiority over the solvent power of the hot water, and by continuing the evaporation, the whole of the water will be driven off, and the salt deposited in an amorphous uncrystallized mass; but if, when the pellicle appears, the solution is slowly cooled, it will deposit, as at first, in a crystalline state, all that portion of salt which, in the cold saturated solution, was combined with the water which has evaporated. Thus, by successive evaporation and gradual cooling, all substances, capable of crystallizing, and which are more soluble in hot than in cold water, may be procured in their proper crystalline forms.

A few salts, especially muriat of soda, (common salt) are nearly equally soluble in water of any temperature; these therefore can only be obtained in a crystalline state, by a carefully regulated evaporation.

All crystals that are formed in water retain a portion of this fluid; which is called the *water of crystallization*. Its proportion varies in different salts, and appears to be in an inverse ratio to the force of their crystalline polarity. Thus,

C R Y S T A L.

fulphat of pot-ash, which requires a large quantity of water to counterbalance the cohesive force of its particles, contains but little water of crystallization; whereas fulphat of soda, which is readily soluble in water, holds more than half its chemical weight of this fluid. This water appears to be in a state of combination with the salt, and not simply interposed between its laminae: the affinity however which it exerts, is but feeble, at least in those salts into the composition of which it enters largely, since a considerable proportion of it is driven off merely by exposure to the air. In these cases, the crystal moulders away to powder, and entirely loses its peculiar form and texture.

If a crystallizable salt is perfectly pure, its solution will continue to afford crystals by the common treatment to the very last drop; but as all salts have a greater or less chemical action on each other, it usually happens, when two or more co-exist in the same solution, that after crystals have been obtained by successive evaporations and coolings, the remaining portion of fluid, though changed to saturation with saline matter, refuses to yield any more crystals. This liquor, whatever may be the nature of its contents, is known by the general appellation of *mother water*. Those salts, the crystals of which are permanent in the air, have the strongest degree of crystalline polarity; in those which are efflorescent, this force is considerably less, but it is the weakest of all in those that deliquesce on exposure to the air. Now, if two salts are dissolved together in the same quantity of water, provided they do not decompose each other, and especially if their ratios of solubility are different; although they are rendered more soluble by their mutual affinity, yet they may be obtained again in the crystalline state without leaving any mother water. Thus, equal parts of nitrat of pot-ash and fulphat of pot-ash, though soluble when mixed together in less water than would have been necessary for both separate, afford by evaporation, successively, and in proportion to their solubility, first fulphat of pot-ash, and then nitrat of pot-ash, without leaving any uncrystallizable liquid. But on the other hand, if nitrat of soda, and fulphat of soda are subjected to the same experiment, both of which have only a slight tendency to crystallize, and are of nearly equal solubility, only a small quantity of fulphat of soda will separate by crystallization, all the nitrat and the remainder of the fulphat remaining liquid and uncrystallizable. When the mutual action of the two salts is sufficient to effect a double decomposition of them, it is necessary to take into consideration the solubility of the new salts, in order to make a correct estimate of the quantity of uncrystallizable residue. Thus, if equal parts of fulphat of magnesia and muriat of soda are mixed together, although the ratio of solubility of the two is different, and their force of crystallization also considerable, yet the liquor can hardly be made to yield any crystals at all; for in consequence of a mutual decomposition, muriat of magnesia, a deliquescent salt, and fulphat of soda, an efflorescent one will be formed; and the slight crystalline force of the latter will be almost wholly annulled by the extreme solubility of the former.

In many instances, the disturbance occasioned by ebullition and other causes of agitation, prevents the formation of regular crystals. But though this is the case, it does by no means follow that the entire absence of external motion is peculiarly favourable to crystallization. The solutions of those salts that are much more soluble in hot than in cold water, and have but a feeble power of crystalline polarity, may, if kept still, be cooled by degrees considerably below their congealing or crystallizing point, and still retain their fluidity; apparently because the attraction of their particles, in itself feeble and opposed by the affinity

of the water, is held in equilibrium because no one particle has a preponderating power over those in its vicinity; for if a piece of the same kind of salt that is contained in the solution, be introduced, even with the utmost precaution, the inferior attraction of the mass will be immediately exerted on the adjacent particles, and a rapid growth of crystals will take place, radiating from this mass as their centre of attraction. Crystallization may also be induced in similar circumstances, merely by agitation, but when this is the case, it is always confused and irregular.

Although several varieties of form in crystals had been observed by chemists and naturalists, yet they were rather objects of vague curiosity than of scientific attention, before the time of Linnæus. This able man, who aspired to be the classifier and lexicographer of the whole terrestrial world, observed a resemblance more or less perfect between the forms of various salts, and of several of the native crystallized minerals. The faculty of crystallizing he considered as peculiarly characteristic of saline substances, and hence concluded that all the crystallized earthy minerals were compounded of earth and some particular salt, to the latter of which was owing their external figure. Hence, because both nitre and quartz crystallize in the form of hexahedral prisms, terminated by hexahedral pyramids, he considered the former as the type of a whole genus, of which the latter was one of the species. So again, observing that alum and the diamond crystallize in pyramidal octohedrons, he arranged the latter as a species of the genus alum. The principal foundation of this theory, namely, that the particular forms of earthy crystals are owing to the presence of a salt, was soon after demonstrated by Wallerius and others, to be wholly groundless, yet the hypothesis, however erroneous, had already induced mineralogists to pay more attention to the forms of crystals than they had heretofore been accustomed to do, and thereby prepared the way for the more important discoveries of Romé de Lisse.

It was in consequence of the minute, ingenious, and multiplied labours of this able philosopher, that crystallography first assumed the appearance of science. He accurately examined all the crystalline forms that fell under his observation, delineated them with accuracy, ascertained the measurement of their principal angles, and arranged them with great sagacity, into species and varieties. Out of the various forms which each species exhibited, he selected one, which, from its simplicity, appeared to possess the fairest claim to be considered as the primitive form of the species; and from this, by supposing it truncated in different directions, he deduced, in a most ingenious manner, a regular gradation through the least to the most complex of the forms belonging to each species. He also made the interesting discovery, that the principal of the angles formed by the incidence of the circumscribing planes on each other, are always of the same dimensions, notwithstanding the truncatures and other modifications undergone by the primitive figure; and also that the dimensions of these angles vary in every different species, although the general figure of the crystals may be the same. Thus, having ascertained that the primitive crystalline form both of alum and nitre, is the pyramidal octohedron, composed of two four-sided pyramids united at their bases, he found that the two species might be accurately distinguished by the incidence of the corresponding planes of the two pyramids on each other; the amount of this angle in the octohedrons of alum being constantly 110° , and in those of nitre 120° .

The great objection to the system of Romé de Lisse is, that the forms which he has selected as the primitive ones

in each species are not demonstrated, but only presumed to be so, on account of their simplicity. The whole theory of truncatures also is allowed by the author to be merely hypothetical, or rather to be wholly different from the method pursued by nature in the formation of crystals, there being no example of any one variety of these being ever produced by the actual truncation of the primitive figure. In consequence of these objections, Bergman was induced to suppose, that the varieties in crystallization are not owing to truncations of the primitive figure, but to the superposition of secondary laminæ upon its faces, either in regular, or variable and decreasing proportions. According to this hypothesis, it would follow, that if the external laminæ of any crystals were taken off in regular succession, the remaining nucleus would be constantly approaching to the primitive form, and would at length actually arrive at it. This Bergman demonstrated to be the case with that variety of calcareous spar called dog-tooth spar, by an actual dissection of the crystal; he discovered the various directions of the crystalline laminæ of which it is composed, and by removing these in succession, he arrived at a rhomboidal solid, divisible only by planes parallel to its surfaces, and therefore un susceptible of undergoing any further change of form. But in an attempt to apply this brilliant discovery to another variety of calcareous spar, he was not equally successful as at first, and appears to have proceeded no further in the investigation of the subject.

Much about the time of Bergman's discoveries, M. Hany had begun to investigate the same subject; he duly appreciated the discovery of the Swedish philosopher, adopted his fundamental proposition, and by a most masterly combination of algebraical and geometrical reasoning, with unparalleled dexterity in the dissection of crystals, he has produced a theory of their formation most remarkably beautiful and consistent, and which has been applied by him with the happiest success, in the resolution of the most intricate figures, and the reduction of them to the most simple primitive forms. We shall therefore conclude this article by a detailed view of M. Hany's Theory of the Structure of Crystals.

The mechanical division of crystals is the only method by which their primitive forms can with certainty be determined; and from the results of a multitude of these dissections, the following general conclusion (subject to certain restrictions, which will be hereafter mentioned,) may be deduced; that all crystals belonging to the same species, (that is, which agree in their chemical composition,) however great may be the difference of their external figures, are reducible by the successive abstraction of their laminæ to one and the same primitive form. This will best be illustrated by a few examples.

Take a regular hexahedral prism of calcareous spar, (CRYSTALLOGRAPHY, *Theory of*, Plate I. *figs.* 1, 2.) If an attempt is made to divide this, upon the edges adjacent to the bases, it will be found that only three alternate edges at the upper extremity of the crystal, represented by the letters *lf, cd, bm*, will admit of being thus divided: it will also be found that only three alternate edges at the lower extremity can be divided, and that these edges instead of corresponding with those of the upper extremity as *l'f', c'd', b'm'*, are the intervening ones *d'f', b'c', l'm'*. The six sections being made in the direction above indicated, will produce a like number of trapezoidal planes, three of which are represented in *fig. 2*, namely, *ppoo, aakk, nnii*. Each of these planes will exhibit a degree of pough and lustre, by which it will be readily recognized as the area of one of those crystalline laminæ of which the whole solid is com-

posed; and if the prism is divided in any other direction, it will be evident, from the roughness and dullness of the fractured surface, that such section does not correspond with any of the natural joints of the crystal. The division of the crystal being continued in a direction parallel to the first sections, it will happen, on the one hand, that the areas of the bases will be continually lessening, and at the same time that the height of the lateral faces will be diminishing, and where the bases are completely obliterated the prism will have been converted into a dodecahedron, with pentagonal faces, six of which, as *ooiOe, oIkii*, &c. are the residues of the original faces of the prism, and the six others, as *EAIoo, OA'Kii*, &c. are the immediate results of the mechanical division.

The section of the crystal being still persevered in, it is obvious that the terminal planes will preserve their figure and dimensions, while the height of the lateral ones will be continually diminishing, till the points *o, k*, of the pentagon *oIkii*, coinciding with the points *i, i*, and so of the other points similarly situated, each lateral pentagon is reduced to a simple triangle, as in *fig. 4*. And when, at length, by a continuation of the same mechanical division, these triangles have disappeared, all the original faces of the prism being completely obliterated, the primitive nucleus of the crystal will be obtained, in the form of an obtuse rhomboid, the large angles of which, *EAI*, or *EOI*, measure $101^{\circ} 32' 13''$.

If, for a second example, we take a crystal of dog-tooth calcareous spar (*fig. 6*), it will be found that, by making one section through the edges *EO, OI*; a second through *JK, GK*; a third through *GH, EH*; a fourth through *OI, IK*; a fifth through *GK, GH*; and a sixth through *EH, EO*, the primitive rhomboid will be at once obtained; whence it follows, that the edges above-mentioned correspond with the lateral edges of the primitive nucleus, as is obvious, at first sight, from *fig. 7*, which represents this primitive figure, inscribed in a pyramidal dodecahedron, with scalene triangular faces.

Thus, in like manner, all the crystalline forms of calcareous spar, even those that differ the most from the primitive one, may be reduced by mechanical division in the directions of their laminæ to the rhomboid.

It has already been mentioned, that the primitive form of each species is constant, not only in its figure, but also in the dimensions of its angles; but when we find that there are several rhomboids of calcareous spar, which differ very materially from each other in the measurements of their angles, it may be thought that this circumstance invalidates the above assertion. But this objection, though plausible, is by no means real; for none of these secondary rhomboids are divisible parallel to their sides, and, therefore, want the essential characteristic of a primitive crystal; further, they are all reducible to the primitive form by the successive removal of their external laminæ, as we shall proceed to shew, in the instance of the secondary rhomboid, the plane angles of which, surrounding the summits, are $75^{\circ} 31' 20''$, and which is represented by *fig. 8*, inclosing its primitive nucleus. In order to effect the mechanical division of this crystal, sections must be made parallel to the six terminal edges *st, su, sn*, at one extremity, and *s't', s'u', s'n'*, at the other, so that every one of these secondary planes shall intercept equal and similar portions of the two adjacent faces of the rhomboid. These sections will produce the six pentagons *r, r, r, r, r, r*, (*fig. 9*) and it is easy to perceive that, by successive sections parallel to these, the original faces of the rhomboid will be obliterated, and the primitive rhomboid *AA* (*fig. b.*) will be produced. It is

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to be remarked also, that the faces of this primitive rhomboid incline in the same degree towards the common axis, as the edges st, su, sn , &c. to which these faces are parallel. But the edges above mentioned form larger angles with the axis, than would be produced by the oblique diagonals sn', st', su' , or, which is the same thing, by the faces $stn'u, sn'u, stu'n$; whence it is obvious that, in the rhomboid extracted by mechanical division, the angles of the summit will be sensibly larger than the corresponding ones in the containing rhomboid.

If, instead of calcareous spar, a crystal belonging to another species is divided in a direction parallel to its laminæ, a different shaped nucleus will be eliminated. For example, a cube of fluor spar will afford a regular octohedron, by dividing it parallel to its eight solid angles; these will first be replaced by an equal number of equilateral triangles; and, at length, when the faces of the cube have entirely disappeared, the crystal will be converted into the regular octohedron. Thus also the primitive form of heavy spar will be found to be a straight prism with rhomboidal bases; that of apatite, a regular hexahedral prism; that of galena, a cube, &c. It is not always necessary to dissect a crystal, in order to reduce it to its primitive form; for we find natural rhomboids of calcareous spar, octohedrons of fluor spar, &c. which, in every respect, exactly correspond with the primitive nuclei extracted mechanically from other varieties of the above species. These natural primitive forms, however, are, upon the whole, of less frequent occurrence than the secondary, or derivative forms.

The number of primitive forms, as yet ascertained, is only six; namely, the parallelepiped (including the cube and rhomboid); the octohedron; the tetrahedron; the regular hexahedral prism; the dodecahedron, with rhombic planes, all equal and similar; and the dodecahedron, with triangular planes composed of two straight pyramids, united by a common base.

The nucleus, or primitive form of a crystal, is, however, by no means the ultimate result of its mechanical division; for every primitive form admits of successive sections parallel to its faces, till it becomes no longer visible to the naked eye; and certain nuclei are also susceptible of transverse or diagonal sections, the result of which is a figure different from that of the primitive crystal. The form produced by the ultimate division of a crystal, may be considered as the representative of its *integrant particles*, and this is the last term to which mechanical division is capable of being carried; the elementary, or chemical component particles, not being susceptible of separation from each other by any other means than chemical attraction, which is wholly different from mechanical force.

If the primitive form of a crystal is a parallelepiped, and can be subdivided only by sections, parallel to its faces, it is evident that the figure of the integrant particles is the same as that of the primitive nucleus. Thus, the primitive form of calcareous spar is a rhomboid; and because this rhomboid is divisible only by sections, parallel to its faces, it necessarily follows, that the form of its integrant particles is also a rhomboid. But it is possible that the primitive parallelepiped may be divided also by planes not parallel to the external faces. For example; let $AA'KH$ (*fig. 10.*) be a rhomboid, divisible at the same time, parallel to the six rhombs by which it is bounded, and in the direction of the short diagonals of the faces. These latter sections will divide the rhomboid into six tetrahedrons, which, in *fig. 10.* are represented as surrounding the nucleus, which may thus be considered as made up of tetrahedral integrant particles. This peculiarity of structure is found in the tourmaline.

An example of the integrant particles, differing in figure

from the primitive nucleus, although this latter is divisible only parallel to its external faces, is afforded by the apatite. The primitive form of this mineral is a regular hexahedral prism, which may be subdivided only by sections parallel to its bases and sides; but from this division will result an assemblage of triangular prisms, as is plain from the mere inspection of *fig. 40.* in which one of the bases of the prism is represented as divided into equilateral triangles, each of which is the base of a small triangular prism, representing an integrant particle.

It is worthy of remark, that the forms of the integrant particles of all crystals may be reduced to one or other of the three above-mentioned, namely, the tetrahedron, the most simple of all the pyramids; the triangular prism, the most simple of all the prisms; and the parallelepiped, the most simple of all those solids, the faces of which are parallel to each other by pairs. And since every plane solid must be bounded by at least four surfaces, it is evident that the three forms above-mentioned, in which the number of faces is successively four, five, and six, are possessed of the greatest simplicity possible.

This general simplicity is, however, by no means incompatible with almost infinite variety in the dimensions of the integrant particles, and the measurements of their several angles. Thus, the parallelepiped may be rectangular, forming a cube or square prism; or may be oblique-angular, forming an infinite variety of rhomboids. The triangular prism also may be equilateral or isosceles; and the pyramidal tetrahedron may exhibit analogous diversities.

There are, however, certain forms of integrant particles, as well as of primitive nuclei, which are common to two or more different substances. Iron pyrites and common salt, for example, have each of them a cube for their primitive nucleus: ruby and native bismuth present the regular octohedron. But it is remarkable, that all those forms which are common to several minerals, are characterized by the utmost possible simplicity and regularity, as the cube, the regular octohedron, the dodecahedron with rhombic planes.

It remains to give a brief account of the peculiar modes of arrangement followed by the integrant particles, by which are produced those regular coverings of crystalline laminæ, which disguise, under such various forms, one and the same primitive nucleus.

Now, experiment and observation shew, that this covering matter is an assemblage of laminæ, which, proceeding from the primitive nucleus as a centre, constantly decrease in extent, either on all sides, equally, or more on some than on others. This decrement is effected by regular subtractions of one or more rows of integrant particles, either on the sides or solid angles of the primitive form. A few simple instances will serve to give a clear idea of the laws to which these decrements are subject.

Let ss' (*fig. 11.*) represent secondary crystal, in form of a rhomboidal dodecahedron, with a cube for its primitive nucleus. In order to extract this nucleus, it is necessary to remove, successively, the six solid angles, composed of four planes each, as s, r, t , &c. by sections passing through the short diagonals of the three rhombic faces, of which the summits OA' are composed; the planes of these sections will form as many squares, $AEOI, EOO'E, IOO'I$, &c. *fig. 12.* which are the faces of the cube.

Now, suppose that each of the faces of the cube supports a series of decreasing laminæ, composed of cubical particles, every one of which exceeds that immediately above it, by one row of particles on each of its four sides; the necessary result, therefore, will be the formation of six quadrangular pyramids, resembling flights of steps, resting on the

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the six faces of the primitive cube. Three of these pyramids are represented in *fig. 13*, having their summits at *s, t, r'*. These six quadrangular pyramids are composed of twenty-four triangles, as *O s I, O t I, &c.*; but because the decrement is uniform, from *s* to *t*, and so of the rest, the opposite triangles of two adjacent pyramids are on the same level and form a rhomb, as *s O t I*. The surface of this secondary solid will, therefore, be bounded by twelve equal and similar rhombs, or, in other words, the rhomboidal dodecahedron (*fig. 11.*) will be recomposed.

This dodecahedron is represented in *fig. 13*, in such a manner, that the progressive decrement of the superposed laminæ is visible to the naked eye. The cubical nucleus, it is to be observed, has each of its faces composed of 17 rows of integrant particles, which will give 289 for the area of each surface, and 4913 for the solid contents of the cube. This primitive form is covered by eight superposed laminæ, (the upper consisting of a single particle) the length of the sides of which are equal, respectively, to 15, 13, 11, 9, 7, 5, 3, 1 particles, forming a series, the common difference of which is 2, there being one row subtracted from each end.

If, to the above representation of integrant particles, which, however coarse, has yet the advantage of being obvious to the eye, we substitute, in imagination, the almost infinitely delicate structure of real crystals, we must conceive the primitive nucleus as composed of a vast multitude of cubes, each of which singly is imperceptible; in which case, the number of superposed laminæ will also be far greater than in the preceding hypothesis. Hence it will follow, that the striæ, formed upon the faces of the dodecahedron, by the alternate salient and re-entering angles of the superposed laminæ, though they really exist, will yet, from their minuteness, be invisible to the naked eye.

In the example just given, the ratio of the decrement is equal to two rows of integrant particles subtracted from the breadth of the superposed laminæ; therefore, the height of the pyramid thus produced is equal to half the length of one of the sides of its base; but the ratio may be equal to one, three, four, five, or six rows, in which cases the height will be to the breadth of the pyramid, as 1 : 1, $\frac{1}{3}$: 1, $\frac{1}{4}$: 1, $\frac{1}{5}$: 1, $\frac{1}{6}$: 1. But the decrements of these superposed or secondary laminæ, may be considered as taking place, not merely in breadth, but in height; and the ratio or common difference of these latter may also vary from one to six rows of integrant particles, in which cases the height will be to the breadth of the pyramid, as 1 : 1, 1 : $\frac{1}{2}$, 1 : $\frac{1}{3}$, 1 : $\frac{1}{4}$, 1 : $\frac{1}{5}$, 1 : $\frac{1}{6}$. It not unfrequently happens, that these two kinds of decrement are united in the same crystal; and to this circumstance it is that the great variety of crystalline forms, under which the same substance appears, is chiefly to be attributed.

The dodecahedral iron pyrites, with pentagonal faces, is an example of the combination of the two modes of decrement. The primitive nucleus of this substance is a cube, the position of which, with regard to the circumscribing dodecahedron, is evident from the mere inspection of *fig. 15*. In this the superposed laminæ, instead of forming pyramids, as in the foregoing example, compose very obtuse, wedge-shaped solids, bounded by two trapeziums, as *O I p q*, *A E p q*, and two isosceles triangles *E p o*, *A q I*.

Now suppose a decrement to take place by two rows in breadth between the sides *O I* and *A E*, *I I'* and *O O'*, *E O* and *E' O'*, and so in like manner on the opposite squares, and that a decrement, by two rows in height, takes place at the same time between the sides *E O* and *A I*, *O I* and *O' I'*, *O O'* and *E E'*; it is then obvious

that the two kinds of decrement are carried on upon the different faces of the cube in such a manner as to cross each other at right angles in three directions. And the decrement, by two rows in breadth, tending to produce a more inclined face than the decrement by two rows in height, each pile of superposed laminæ will terminate not in a point, but will produce a wedge-shaped solid, *fig. 16*, that is to say, it will be terminated by the edge *p q* or *t n*; and if the directions of these two edges are compared with that of the edge *r s*, (*figs. 14* and *15.*) which terminates the pile raised on the face *E O O' E'* of the nucleus, it will be plain that these three edges are perpendicular to each other.

Further, each trapezium, as *O p q I* (*figs. 15* and *16.*) being on the same plane as the triangle *O t I*, which belongs to the adjacent pile, will be confounded with it, and the result of this union will be the pentagon *p O t I q*, whence it follows that the whole solid will be bounded by twelve equal and similar pentagonal faces, on account of the regular form of the nucleus and the symmetry of its decrements.

Both the kinds of decrement which we have hitherto described, commence from the sides or edges of the primitive nucleus; but these are not sufficient to explain all the varieties of form presented by secondary crystals. Both observation and calculation demonstrate that there are also decrements commencing from the angles, and proceeding in a direction parallel to the diagonals of the faces. This is proved from the circumstance, that the same substances which, having a cube for their primitive nucleus, appear under the forms of the pentagonal and rhomboidal dodecahedrons, are also found under that of the regular octohedron. It seems, indeed, at first sight, very possible to deduce this octohedron from a decrement on the edges of the cubic nucleus, for if the secondary laminæ are considered as superposed only on two opposite faces of the cube, as for example on *A E O I*, and *A' E' O' I'*, (*fig. 20.*) there will be formed on these bases two pyramids, and if the faces of each pyramid are supposed to be prolonged till they meet, which will be effected merely by a continuation of the same law of decrement by which the pyramids themselves are formed, there will be produced an octohedron, the angles of which will vary as the decrement has been made by the subtraction of one or more rows. But it may be demonstrated by calculation, that no law of decrement, however complex, will produce an octohedron, the faces of which are equilateral triangles, if this decrement takes place from the edges of a cubical nucleus.

On the other hand, if we actually dissect a regular octohedron, moulded on a cube, we shall perceive that this primitive nucleus is so situated with regard to the octohedron, that each of the eight solid angles of the former correspond with the centres of the triangular faces of the latter; a fact wholly irreconcilable with the hypothesis of a decrement on the edges. *Fig. 20*, represents this arrangement, and it is obvious that in order to disengage the nucleus, it is necessary to destroy the six solid angles of the octohedron by sections perpendicular to the axes passing through these same angles, and therefore of course parallel to the faces of the cube.

In order to explain the law of decrement on the angles which takes place in the preceding example, let *O I I' O'* (*fig. 21.*) be one of the faces of the cubic nucleus, subdivided into a multitude of lesser squares, which are the bases of an equal number of integrant particles. These rows of particles may be considered in two different directions, namely, as parallel to the sides, as the row *a, n, q, r', s'*, or as parallel to the diagonal of the face, as the rows *a, b, c, d, &c. n, l, h, m, &c. q, v, k, u, &c.*

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The particles of the rows parallel to the sides, touch each other by one of their faces, and are in a state of simple juxtaposition. But the particles of the rows parallel to the diagonals, touch each other only by one of their edges, and each row is, as it were, locked into that adjacent to it on each side. Now it appears that the laminae superposed on the faces of a cubic nucleus, or of any other, not infrequently decrease by the subtraction of diagonal rows of particles. In this case the secondary faces thus produced, are not striated, (as they are where the decrement takes place parallel to the edges,) but set, all over, with points, which being all on the same level, and of extreme minuteness, appear to the eye like a plane surface. If now we suppose all the laminae superposed on a cubical nucleus, to decrease by one row on all the angles of the nucleus, this decrement will produce the regular octohedron, the mechanical division of which has been already described.

In order to explain the operation of this law of decrement, let $\Delta E O I$, (*fig. 23, A.*) be the upper surface of a cubical nucleus composed of eighty-one smaller squares representing an equal number of integrant particles. The first of the superposed laminae will be of the form represented (*fig. 23, B.*) and will be so placed on the face of the nucleus, that the points e, a, o, i , of the latter, correspond with the points e', a', o', i' , of the former. According to this disposition the squares Ee, Aa, Oo, Ii , (*fig. A.*) remain uncovered, which is the first effect produced by the particular decrement just mentioned. It is further to be observed, that the sides QV, PN, LC, FG , (*fig. B.*) exceed by one row the corresponding sides AE, EO, OI, IA , (*fig. A.*), this being necessary in order that the nucleus should be covered on the above sides, and that the solid should increase in the usual manner in those parts to which this particular law of decrement does not extend.

The upper surface of the second laminae will be similar to $BKH D$, (*fig. 23, C.*) and it is to be placed on the preceding, so that the points e'', a'', i'', o'' , may coincide with the points e', a', i', o' , *fig. B.*, in consequence of which the squares which have their external angles situated at Q, S, R, V, P, T, M, G , &c. will be left uncovered by the subtraction of one row of particles. It is to be observed, also, that the solid continues to increase on the sides analogous to EA, EO, AI, OI , (*fig. A.*); but as the effect of the decrement is continually contracting the surface of the laminae, in the direction of the diagonals, there is only a single cube added on the sides B, K, H, D , (*fig. C.*) not subject to the decrement, instead of the five cubes by which the preceding lamina is terminated on the sides QV, PN, LC, FG , (*fig. B.*)

The surfaces of the superpole laminae, which hitherto have been octagonal, as *fig. B.*, having by the progressive effect of the decrement become square, as *fig. C.*, will now decrease on all their sides at the same time, so that the next lamina will have for its surface the square B', K', H', D' , (*fig. D.*) being less by one row of particles on each side than the preceding square (*fig. C.*) and so placed upon it that the points e, f', a', g' , (*fig. D.*), correspond with the points e, f, a, g , (*fig. C.*)

The *figs. E, F, G, H, I*, represent the five succeeding laminae necessary to complete the pyramid, the latter of which, forming the summit of the pyramid, is only a single cube.

From the above description it will appear that the laminae superposed on the base E, A, I, O , (*fig. A.*) produce by the effect of their decreasing edges, four faces, which produced from the points E, A, O, I , incline towards each other, forming a pyramidal summit.

It is to be remarked, also, that the superposed laminae begin by increasing in length, as is obvious from *figs. B* and *C*, and then gradually diminish, as is represented in the succeeding figures. Hence it follows that the secondary faces themselves first enlarge to a certain point, and then diminish, so that they form, as it were, two triangles, joined at their bases, or in other words, a quadrilateral figure. One of these is represented *fig. 24*, in which the inferior angle o coincides with the angle O of the primitive nucleus (*fig. 20.*) and the diagonal ix , represents the side HK of the lamina $BKH D$ (*fig. 23, C.*); and because the superposed laminae that produce the triangle iox (*fig. 24.*) are less in number than those of which the triangle ixx is composed, the latter triangle will be much higher than the former.

The surface of the secondary crystal will therefore be made up of 24 quadrilateral planes, disposed in threes round each solid angle of the nucleus; but, as in decrements that take place by one row on every edge, the opposite faces on each edge are in the same plane, so in decrements by one row on the angles, the three secondary faces that are produced round each solid angle, as O (*fig. 20.*) are also on a level, and may therefore be considered as forming only a single one; and since a cube has eight solid angles, each composed of three plane ones, the secondary crystal will have eight faces, which, on account of the regularity of the nucleus, will be equilateral triangles; so that the whole crystal will be a regular octohedron. One of these triangles is represented, *fig. 25*, so as to show the arrangement of the small cubical particles by which it is produced.

The above may serve to give a general idea of M. Haüy's Theory of Crystallography, for a more full account of which we refer the curious reader to the first vol. of this author's "Traité de Minéralogie."

CRYSTALS, in the *Arts* When any piece of workmanship in crystal is become foul and dark, the method of recovering its lustre without hurting its polish, is this: mix together six parts common water, and one part brandy; boil these over a brisk fire, and let the crystal be kept in it, in a boiling state, a quarter of an hour; then take it out, and rub it carefully over with a brush dipped in the same liquor; after this, it is not to be left to dry of itself, but to be wiped with a clean napkin, and its surface will by this means be perfectly cleaned, and rendered as bright as at first, without that injury to the points of the cutting, or to the surfaces of the planes or facets, which would naturally have been the consequence of doing it by mere rubbing or wiping.

Natural crystal may be reduced, by calcination, into the state of the bodies proper for making glass with alkali salts, and makes a most fine and valuable frit. The method of doing it is this: calcine natural crystal in a crucible; when it is red hot, throw it into cold water to quench it; repeat this eight times, covering the crucible, that no dust or ashes may get in and mix with the crystal; dry this calcined mass, and reduce it to an impalpable powder; mix three pounds of this powder with two pounds of pure salts of polverine, or with a quarter of a pound of red lead, and with these make frit, and with the proper quantity of manganese, or other tinging substance; wash this often in cold water, and after a proper time, work it; it will yield a most beautiful glass. Some have pretended to colour crystals by thus tusing them, and imparting the various tings to them while in a melted state. But as they cannot be fused by the heat of furnaces, without the medium of some fluxing body added to them, their texture and properties

perties are so changed, or rather the glass produced by the composition is so different from the crystal itself, that there does not appear to be any advantage in employing rock crystal in such a composition preferable to flints. *Hand. Arts*, vol. ii. p. 327.

Natural crystal may be coloured of several colours, without melting or running it into glass, in the following manner. Take a number of pieces of fine, clear, and pure crystal, of various sizes, of white arsenic, and yellow orpiment in powder, of each two ounces; sal ammoniac, one ounce; powder this also, and mix them well together; put this powder into a strong crucible; and lay upon it the pieces of crystal in their natural state, then cover this crucible with another, mouth to mouth; lute them well, and when the lute is dry, set them in coals, which kindle by little and little; and when they begin to fire, let them kindle of themselves, and they will then smok very much. Let this be done in a large chimney, taking care to avoid the fumes. When it fumes no more, let the fire go out of itself, and let all stand till cool; then unlute the crucibles, and take out the crystals; those at top will be coloured to a fine yellow, with a deep and pale red, the colours of the common fine and balas ruby, with beautiful spots; and those which are at the bottom upon the powder, will be of a watery colour, mottled like that of the viper. This crystal comes out so fair from this process, that it may be cut as a gem; and though many are spoiled, yet, in making a large quantity, there are always some fair and perfect. *Neri's Art of Glass*, p. 117. See DOUBLETTS, and OPAL.

Baptista Porta directs to colour crystals by keeping them immersed for four or five hours in a melted mixture of sulphur, crude antimony, orpiment, arsenic, and tutty. In these operations, the crystals seem to imbibe some of the vapours of the metallic substances; though the method of giving colours to crystals by cementation seldom or ever fairly succeeds.

CRYSTAL, *Rock*, in *Mineralogy* and *Natural History*. See QUARTZ.

CRYSTAL-glass, the purest sort of glass, forming the basis of the facitious gems. For a particular description of which, see GLASS, *the manufacture of*.

CRYSTAL, or CREAM of tartar, is tartar purified and dissolved, and again crystallized. For an account of its properties, and the method of preparing it, see TARTRITE of potash, (*acidulous*.)

CRYSTAL of tartar chalybeated, or ferrum tartarizatum; see IRON, *tartrite of*.

CRYSTAL mineral, called also mineral anodyne, and sal prunella, is nitre detonated with sulphur, thus; put a pound of nitre in a crucible, and set that in a furnace; and when the nitre is in fusion, let it be detonated with a dram of sulphur; after the detonation is over, pour the fluid into moulds, where it soon hardens into a white crystalline mass.

CRYSTALS of silver, or luna. See SILVER, *nitrat of*.

CRYSTALS of Mars, called also salt, or vitriol of Mars: See IRON, *sulphat of*.

CRYSTALS of Venus, or of copper, is nitrat of COPPER; which see. Acetite of copper, or crystallized verdegris, is also sometimes called by this name.

CRYSTAL of Iceland, or Island, is very pure calcareous spar, in oblique rhomboidal prisms; for a particular description of which, see LIMESTONE, *foliated*.

The Iceland crystal is electrical, and when rubbed will draw up straws, feathers, and other light substances, in the same manner that amber does.

The vast masses of white spar which are found in the lead

mines of Derbyshire, though they are not externally of the paralleloiped figure of the Iceland crystal, nor have any thing of its brightness or transparence in the general lump; yet when they are broken, they separate into rhomboidal fragments, and some of these are found to be tolerably pellucid: all those which are so, have the property of the Iceland crystal; and being laid upon paper, where a black line is drawn, they all shew that line double in the same manner as the real Iceland crystal does.

Iceland crystal bears a red heat without losing its transparency; and, in a very intense heat, calcines without fusion; steeped a day or two in water, it loses its natural polish.

It is very soft, and easily scratched with the point of a pin; it will not give fire on being struck against steel; and ferments, and is perfectly dissolved in aqua fortis. It is found in Iceland, from whence it has its name; and in France, Germany, and in many other places. In England, fragments of other spars are very often mistaken for it, many of them having, in some degree, the same property.

Bartholine, Huygens, and sir Isaac Newton, have described the body at large, but have accounted it either a crystal or a talc, errors which could not have happened, had the criterions of fossils been at that time fixed; since sir Isaac Newton has recorded its property of making an ebullition with aqua fortis, which alone must prove that it is neither talc nor crystal, both these bodies being wholly unaffected by that menstruum.

The phenomena of this stone are very remarkable, were first suggested by Bartholine, and have been examined with great accuracy by M. Huygens, and sir Isaac Newton.

1. Whereas in other pellucid bodies there is only one refraction, in this there are two; so that objects viewed through it appear double.

2. Whereas in other transparent bodies, a ray falling perpendicularly on the surface, passes straight through, without suffering any refraction; and an oblique ray is always divided; in Iceland crystal, every ray, whether perpendicular or oblique, becomes divided into two, by means of the double refraction. One of these refractions is, according to the ordinary rule, the sine of incidence out of air into crystal, being to the sine of refraction as five to three; but the other is perfectly new. The like double refraction is also observed in crystal of the rock, though much less sensibly.

When an incident ray is thus divided, and each moiety arrives at the farther surface, that refracted in the first surface after the usual manner, is refracted entirely after the usual manner at the second; and that refracted in the unusual manner in the first, is entirely refracted after the like manner in the second; so that each emerges out of the second surface, parallel to the first incident ray. Again, if two pieces of this crystal be placed over each other, so that the surfaces of the one be parallel to the corresponding ones of the other; the rays refracted in the usual manner in the first surface of the first, are refracted after the usual manner in all the other surfaces; and the same uniformity appears in the rays refracted after the unusual manner; and this in any inclination of the surfaces, provided their planes of perpendicular refraction be parallel.

From these phenomena sir Isaac Newton infers, that there is an original difference in the rays of light; by means whereof some are, here, constantly refracted after the usual manner; and others in the unusual manner. Were not the difference original, and did it arise from any new modifications impressed on the rays at their first refraction, it would be altered by new modifications in the three following ones; whereas, in fact, it suffers no alteration at all.

Again,

Again, he hence takes occasion to suspect, that the rays of light have several sides, endued with several original properties; for it appears from the circumstances, that these are not two sorts of rays differing in their nature from each other, one constantly, and in all positions, refracted in the usual, and the other in the unusual manner; the difference is; the experiment mentioned, being only in the position of the sides of the rays, to the plane of perpendicular refraction. For one and the same ray is refracted sometimes after the usual, and sometimes after the unusual manner, according to the position of its sides to the crystal; the refraction being alike in both, when the sides of the rays are pointed the same way to both, but different, when different.

Every ray, therefore, may be considered as having four sides, or quarters; two of which, opposite to each other, dispose the ray to be refracted after the unusual manner; and the other two in the usual. These dispositions, being in the rays before their incidence on the second, third, and fourth surfaces; and suffering no alterations, for what appears in their passage through them, must be original and connate.

Father Beccaria corrects the observations of Huygens and Newton concerning the refraction of rock or mountain crystal. The double refraction of the latter happens, when a ray passes through two sides that are inclined to each other, and consequently issues coloured; whereas that of the Iceland crystal is made by the passage of a ray through two parallel sides, and therefore it issues colourless. He suggests, that there may be other substances, in which there is a manifold refraction. Gravesande had a prism of Brasil pebble, which had a double refraction at each angle, but of a different kind from one another. *Phil. Transf.* vol. lii. part ii. p. 487, &c. Mr. B. Martin prepared several prisms of Iceland crystal, which exhibited not only a double but a multiple refraction. A single prism produced a six-fold refraction; and by combining several prisms, a number of refractions was obtained equal to the product of those of the single prisms; *i. e.* a prism which afforded two images applied to one of six, produced a prism of twelve images, &c. He farther observes, with respect to Iceland crystal, that though the sides of its plane of perpendicular refraction be parallel to one another, a beam of light transmitted through them will not be colourless; in which property it differs from all other known substances. See Martin's *Essay on Iceland Crystal*, or Priellley's *Hist. of Vision*, period vii. § 8. p. 543, &c. See REFRACTION.

CRYSTALLINE LENS, or *CrySTALLINE Humour*, in *Anatomy*, a transparent body, nearly spherical in form; imbedded in the anterior part of the vitreous humour, where it is enclosed by the membrana hyaloidea passing before and behind it; which portions of membrane form its capsule. See EYE.

The crystalline is set in the anterior part of the vitreous humour, like a diamond in its collet; and is retained there by a membrane which surrounds it; and which, for that reason, is called the capsule of the crystalline. This membrane is sometimes also called crystallioides; and by others, on account of its fineness, which resembles that of a spider's web, arachnoides.

It is the configuration of the crystalline that occasions persons to be either myopes, or presbyta; *i. e.* to be either long, or short-sighted; a discovery first suggested, and proved by Maurolycus of Messina, in a treatise, *De Lumine & Umbra*, published in 1575. Bapt. Porta thought that this humour was the principal seat of vision.

The crystalline being of two consistences, outwardly like a jelly, but toward the centre as hard as salt; hence some

authors think, that its figure may be varied; which variation they suppose to be effected by the ligamentum ciliare. Hence, Dr. Grew, and others, ascribe to the ciliary ligament a power of making the crystalline more convex, as well as of moving it to or from the retina: accordingly, by the laws of optics, something of this kind is absolutely necessary to distinct vision: for, as the rays from distant objects diverge less than those from nigh ones; either the crystalline humour must be capable of being made more convex, or more flat; or else there must be an elongation of the eye, or of the distance between that and the retina.

The crystalline humour, when dried, appears to consist of a vast number of thin, spherical laminae, or scales, lying over one another. Leewenhoek reckons there may be two thousand of them in one crystalline; each of these, he says, he has discovered to consist of a single fibre, or fine thread, wound up in a stupendous manner, this way and that, so as to run several courses, and meet in as many centres; and yet not interfere nor cross in any place. *Phil. Transf.* N^o 165, and 293.

The vessels of the crystalline humour of the eye are all the branches of an artery, which being sent off from the artery which enters at the central part of the retina, passes through the vitreous humour, and when it reaches the crystalline, disperses its branches along the surface of the lens like radii, till they are exceeding minute, when they pierce into its substance. *Med. Ess. Edinb.* vol. i. p. 337.

M. Petit, the physician, has many minute observations and experiments on the colour, consistence, measure, weight, &c. of the crystalline humour of the eye, and its capsule in different animals: but his observations are so numerous, that we can only take notice of some of them. He observed, that in serpents and fishes the crystalline is nearly spherical; whereas in all other animals which he examined it was lenticular, the anterior surface being less convex than the posterior.

This humour hardens with age, and is not so hard in men as in birds, quadrupeds, and fishes; its hardness increasing in the order here expressed.

He also observes, that the crystalline changes colour with age, becoming gradually more and more tinged with yellow, after the age of twenty-five years, in proportion to its hardness.

He shews, in confirmation of Leewenhoek's discovery, that the crystalline consists of concentric laminae: he always found the capsule transparent, and denies any connection between this membrane and the crystalline, or that there are any vessels going from the one to the other; but affirms that the crystalline is nourished by absorbing the lymph lodged between it and its capsule.

But Albinus discovered this to be a mistake; and that, on the contrary, it is connected with the capsule by means of several vessels, which, passing through small perforations in the capsule, are inserted at the extremities of it, and spread along the back part of it; and that it receives its nourishment by vessels, which are the branches of the central artery passing through the vitreous humour, and divided into several branches in the back part of the capsule, and transmitted to the interior parts of the crystalline, by which it is also suspended.

Dr. Porterfield has accounted for the greater central hardness of the crystalline; as the rays of light, which fall near its axis, and would consequently be less refracted than those that fall more obliquely nearer the extremities, have hereby their refraction increased, and are made to converge and meet with those at the same point with those that pass through it nearer its edge.

When

When the crystalline or vitreous humours are fallen out of the eye, it is easy to conceive, that not only the sight, but the figure of the eye, must be entirely destroyed; therefore, in an accident of this kind, the eye must at first be dressed with compresses dipped in warm wine, or spirit of wine, and afterwards with some vulnerary balsam. But it sometimes happens, when only the tunica albuginea, and sclerotica, are slightly wounded, the cornea and uvea remaining unhurt, that the eye recovers itself: and though both the vitreous and crystalline humours fall out by the wound, yet they are renewed again by the efficacy of nature, and the office of light performed as well as before the injury happened.

The crystalline is the subject of the disease called a CATARACT, and the operation of COUCHING. See EYE.

CRYSTALLINE Heavens, in the *Old Astronomy*, two orbs, imagined between the primum mobile and the firmament, in the Ptolemaic system, in which the heavens were supposed solid, and only susceptible of a single motion.

King Alphonsus of Arragon is said to have introduced the crystallines, to explain what they called the motion of trepidation, or titubation.

The first crystalline, according to Regiomontanus, &c. serves to account for the slow motion of the fixed stars; which makes them advance a degree in seventy years, according to the order of the signs, viz. from west to east; which occasions the precession of the equinox.

The second serves to account for the motion of libration, or trepidation; whereby the celestial sphere librates from one pole towards another, occasioning a difference in the sun's greatest declination.

But the moderns account for these motions in a much more natural and easy manner.

CRYSTALLIZATION, in *Chemistry*. See CRYSTALL.

CRYSTALLOGRAPHY. See CRYSTAL.

CRYSTALLOMANCY, the art of divining, or foretelling, future events, by means of a mirror; wherein the things required are represented.

It is also called catoptromancy. The first from *κρυσταλλος*, *congealed water*, or *crystal*; and the second from *κατοπτρον*, *mirror*, and *μαντια*, *divination*.

CRYSTINE, in *Commerce*, a silver coin in Sweden, equal to fourteen sols and eleven deniers French. They have also demi-crystines.

CSAKATHURN, in *Geography*, a town of Hungary, situated on a small river between the Muer and the Drave; celebrated for its wine; 20 miles W. of Camischa, and 95 S. of Vienna.

CSABA, a small town of Hungary, in the county of Bekes, on the river Theifs, inhabited by a colony of Bohemians.

CSABRAG, a small town of Hungary, with an ancient castle. There are some mines in its neighbourhood. It is situated in the province of Nagi Hont, and in the district of Buzok.

CSAKA TORNYA, or CSAKATHURN, a small town of Hungary, in the county of Szala, belonging to the counts of Altheim, with a magnificent castle, the fortifications of which are fast decaying. In one of the walls of the castle-yard are the ruins of a monument, erected to a Roman tribune by his wife, under the reign of Antoninus Pius. G. A. H. Gubert. *Journal d'un Voyage en Allemagne*, Paris, 1803.

CSAKOVAR, a small town of Hungary, in the banat of Temesvar, on the river Temes.

CSAKVAR, a small town of Hungary, in the county

of Szabolts, with an old ruined castle, belonging to the family of the Csaki, who descend from the count Szabolts, one of the seven Hungarian leaders that invaded Hungary in the ninth century.

CSANAD, a small town of Hungary, in the county of the same name, on the river Maros. It is the see of a bishop, and carries on a flourishing trade; 64 miles N. of Belgrade, and 200 S.E. of Vienna.

CSEIKO, a small town of Hungary, in the county of Bars, district of Leva; famous for its good wine.

CSEKLES, a small town of Hungary, in the county and district of Presburg, with a handsome palace belonging to prince Esterhazy. It is situated on an eminence.

CSENGER, a small town of Hungary, in the county of Szathmar, with an old castle.

CSEPREG, a small, but formerly very populous, town of Hungary, in the county of Oedenburg or Sopron.

CSERAPUXA, a town and castle of Hungary; 8 miles N.E. of Eriau.

CSERNA, a river of Hungary, which runs into the Danube, near Orsova.—Also, a town of Slavonia; 20 miles S. of Elzek.

CSERNECK, or CSEZNECK, a small town of Slavonia, in that part which is called the bannat of Slavonia, and in the county of Posseg.

CSERNIGRAD, or TARKAVARA, a small town of Slavonia, in that part which is called the bannat of Slavonia, and in the county of Sirmi, on the river Drave. It was anciently fortified, and still retains some traces of a fortress.

CSESZTE, a small town of Hungary, in the county and district of Presburg, on a pleasant eminence near Bibersburg castle.

CSIKVAR, a small town of Hungary, in the county of Stuhl Weissenburg, with an old castle on the river Carvitz.

CSOGOD, a town of Transilvania; 16 miles E. of Udvarhely.

CSOKAKU, a town of Hungary, at the conflux of the rivers Kores and Theifs; 22 miles N. of Zegedin.

CSONGRAD, CZONGRAD, or CZONGRODT, a considerable town of Hungary, in the county of the same name, with an ancient castle, situated at the confluence of the rivers Kores and Theifs.

CSOTORTOK, a small town of Hungary, in the county and district of Presburg, not far from the ancient castle of St. George, which is now a heap of ruins.

CTEMENÆ, in *Ancient Geography*, a town of Greece, in the Æliotide part of Thessaly.

CTENITA, or CTENOIDES, names sometimes given to those peccans which have one of their shells very convex. See PECCEN.

CTESIBIUS, in *Biography*, a mathematician of Alexandria, who was contemporary with Ptolemy king of Egypt, in the 165th Olympiad, about 120 years before Christ. His memory is particularly cherished as the inventor of the pump. The circumstance that led to the discovery was purely accidental. On lowering a mirror into his father's shop, he observed that the counterpoise, which was included in a cylinder, produced a sound, by driving the air before it; and upon examining the phenomenon more closely, he concluded that he might make an instrument, in which sounds should be produced by means of the action of water, driving the air before it. This invention was carried into effect by the emperor Nero. Ctesibius was the inventor, likewise, of a clepsydra, or water-clock. Water was made to fall upon a wheel, or a train of wheels, which were turned by it. The

wheels communicated their motion to a small wooden image, which, by being gradually raised, pointed with an index to the proper hours, that were engraved on a column near the machine. The invention was probably the means of the more modern construction of the sand-glasses for measuring time, which seem an imitation of the clepsydra. Ctesibius was author of a treatise, "Geodesia, or the Art of dividing and measuring Bodies," which is said to exist in the library of the Vatican. Moreri.

CTESIDEMO, an ancient painter, who is celebrated for his picture representing Hercules taking of Oechalia, a city of Bœotia; and for another of Laodamia ascending the funeral pile. Della Valle.

CTESIFONTE, **CHERSIFONTE**, or **CTESIPHON**, the architect who designed the famous temple of Diana at Ephesus, about 550 years before the Christian era. This edifice, which was 200 years in building, was commenced under his direction, and continued under that of Metagenes his son; and is the same which was afterwards fired by Erostratus, actuated, as it is said, in this barbarous enterprise, by no other motive than that of immortalising his name. Milizia Mem. degli Architetti.

He invented a machine that was used to transport the columns of the temple, from the quarries from which they were hewn, to the building of which they were to make a part. This machine consisted of a square frame of wood, of sufficient dimensions to enclose a whole column, with a socket at each end, into which certain strong iron pivots, proceeding from the column itself, were received. By this contrivance, the column became a kind of rolling-stone.

CTESILOCO, the scholar of Apelles, was known by his picture representing the birth of the Egyptian Bacchus, where Jupiter seemed to moan effeminately in the midst of the goddesses, assisting at the labour. Pliny depreciates this painting as highly indecent. It is conjectured by Della Valle, that this artist may have been the same with Ctesiloco, who is said to have been the disciple and brother of Apelles. Della Valle.

CTESIPHON. See **CTESIFONTE**.

CTESIPHON, in *Ancient Geography*, a city of Asia, in Parthia, situated on the eastern bank of the Tigris, opposite to, and at the distance of only three miles from, Seleucia. This city was founded, according to Ammianus Marcellinus (l. xxiii. c. 20.), by Vardanes, and walled and fortified by Pacorus, supposed by Valelius to have been the Orodes, whom Ventidius defeated. Polybius (l. v. c. 45.), Tacitus, Herodian (l. iii. c. 9.), and Strabo (l. xvii.), speak of Ctesiphon as the metropolis of the whole Parthian empire. It was at first an inconsiderable village; but as the Parthian monarchs frequently pitched the imperial camp on the plain in its vicinity, and the innumerable attendants on luxury and dissipation resorted to the court, it insensibly advanced to be a great city. Under the reign of Marcus, A. D. 165, the Roman generals penetrated as far as Ctesiphon and Seleucia; and both cities experienced the same assault and detolation. Although Seleucia sunk under the fatal blow, Ctesiphon, in about 33 years, had so far recovered its strength, that it was able to maintain an obstinate siege against the emperor Severus. The city was, however, taken by assault; the king, who defended it in person, escaped with precipitation; 100,000 captives, and a rich booty, rewarded the fatigues of the Roman soldiers. Notwithstanding these misfortunes, Ctesiphon succeeded to Babylon and Seleucia, as one of the great capitals of the East. In summer, the monarch of Persia enjoyed at Ecbatana the cool breezes of the mountains of Media; but the mildness of the climate engaged him to prefer Ctesiphon for his winter-residence. In the

time of Julian, Ctesiphon was a great and populous city; and Coche, as the only remaining quarter of Seleucia was called, was merely its suburb, connected with it, as we may suppose, by a permanent bridge of boats. The united parts contributed to form the common epithet of Al Modain, "the cities," which the Orientals have bestowed on the winter-residence of the Saffanides; and the whole circumference of the Persian capital was strongly fortified by the waters of the river, by lofty walls, and by impassable morasses. Julian having, after a severe contest, taken possession of Coche, pursued the Persians to the gates of Ctesiphon; and holding a council of war, he declined the siege of the city, as a fruitless and pernicious undertaking, though he was led by an army of 60,000 Romans, A. D. 363. In the year 637, the walls of Ctesiphon, which had resisted the battering-rams of the Romans, yielded to the darts of the Saracens. Said, the lieutenant of Omar, passed the Tigris without opposition: the capital was taken by assault; and the disorderly resistance of the people gave a keener edge to the sabres of the Moslems, who shouted with religious transport, "this is the white palace of Chosroes, this is the province of the apostle of God." The spoils, says Abulfeda, surpassed the estimate of fancy or numbers; and another historian (Elmacin) defines the untold and almost infinite mass by the fabulous computation of three thousands of thousands of thousands of pieces of gold. One of the apartments of the palace was decorated with a carpet of silk, 60 cubits in length, and as many in breadth: a paradise, or garden, was depicted on the ground; the flowers, fruits, and shrubs, were imitated by the figures of the gold embroidery, and the colours of the precious stones; and the ample square was encircled by a variegated and verdant border. The rigid Omar divided the prize among his brethren of Medina. The picture was destroyed; but such was the value of the materials, that the share of Ali alone was sold for 20,000 drachms. The sack of Ctesiphon was followed by its desertion and gradual decay. One of the most considerable ruins of Assyria is the hall of Chosroes at Ctesiphon.

CTISIANA, a town of Africa, in Mauritania Tingitania, according to Ptolemy.

CTYPANSA, a town of the Peloponnesus, in Triphyla, according to Strabo. It is called Tympanæa by Polybius, and Tympancia by Ptolemy.

CUADAC, in *Geography*, a sea-port town of Asia, in Torquin, on a river of the same name.

CUAMA, a river of Africa, at the mouth of which the city and fortress of Sofaia are situated, called by the Arabs and Negroes Zambere and Embouco. Its spring-head is not known; but it surrounds, in some measure, the kingdom of Monomotapa, dividing it on the west from that of Abutua, and on the north from Chicova, Sacomba, and Mauruca. It receives in its course, among other streams of lesser note, the Mangania, Mazeno, and Suabo; and, dividing into two branches, discharges itself into the Indian sea, at four mouths, from north to south, distinguished by as many names; viz. Kilirano, Linda, Cuama, and Luava; or, according to others, Penhamez, Lunagoa, Arruyga, Manjovo, Guadire, and Rueriva.

CUANARAMA, a mountain of New Andalusia, in S. America, which rises 6400 feet above the level of the sea.

CUANDU, in *Zoology*, Coendou of Buffon, Brazilian Porcupine of Pennant, and *Hystrix prebensilis* of Gmelin; which see.

CUARIUS, in *Ancient Geography*, a river of Greece, in Eœotia, according to Strabo.

CUATLACHTLI, or *Lupus Indicus*, in *Zoology*, a

name given by Fernandez to the Mexican wolf, or *CANIS Mexicanus* of Gmelin.

CUB, in *Rural Economy*, a name sometimes applied to a young fox, and also provincially to signify a cattle crib.

CUB, *North*, in *Geography*, a small island in James's bay, Hudson's bay. N. lat. $54^{\circ} 25'$. W. long. $85^{\circ} 50'$.

CUB, *South*, a small island in the same bay. N. lat. $55^{\circ} 42'$. W. long. $86^{\circ} 30'$.

CUBA, in *Ancient Geography*, a town of India, placed by Ptolemy on this side of the Ganges

CUBA, in *Geography*, a name given by the natives of San Salvador to a very large island of the West Indies, one of the Great Antilles islands, when it was first discovered by Columbus in 1492; but he gave it the name of Juanna, or, as some say, Ferdinand, in honour of king Ferdinand, his master. But it soon recovered its Indian name, which it has ever since retained. This celebrated navigator entered the mouth of a large river with his squadron; but as he approached the shore, all the inhabitants fled to the mountains; those who were deputed to examine the interior parts of the country, whilst he was careening his ships, found that about 60 miles from the shore, the soil was richer and more cultivated than any they had hitherto discovered; and, besides many scattered cottages, they saw one village which contained above 1000 inhabitants. The people, though naked, seemed to be more intelligent than those of San Salvador, and treated them as if they had been sacred beings, allied to heaven, paying them respectful attention and kissing their feet; they also gave them to eat a certain root, resembling in its taste roasted chestnuts, and a singular species of corn, called maize, which roasted whole, or ground into meal, was palatable food. They perceived no four-footed animals, except a species of dogs, which could not bark, and a creature like a rabbit, but of smaller size; and they observed some ornaments of gold, which, as the natives reported, was found in "Cubanacan," by which they meant the middle or inland part of Cuba. Columbus visited almost every harbour, from Porto del Principe, on the north coast of Cuba, to the eastern extremity of the island; but, whilst he admired the beauty of the scenery, and the fertility of the soil, he was disappointed by not discovering any quantity of gold. Cuba was not ascertained to be an island till the year 1508, when a captain, named Sebastian, sailed round it by order of Obando, the governor of Hispaniola, for Columbus supposed it to be a part of the continent; nor was it completely conquered by the Spaniards, who sacrificed an incredible number of the inhabitants, till the year 1511. In this year the admiral, Jago, or Don Diego, Columbus sent Jago Velasquez with about 300 men, from Hispaniola, in order to take possession of the island, and to plant it; and he settled on the south coast, near a port which he called by his own name, and which for extent and security may be reckoned one of the finest in the world. While Velasquez was governor of Cuba, he built the city, and port of the Havannah; the houses of which at first were built of wood; afterwards they were constructed of stone, and a fort was erected at the mouth of the harbour. But this port has been often pillaged both by French and English pirates. (See HAVANNAH.) The other principal towns are Santa Cruz, about 63 miles E. of Havannah, Porto del Principe, on the same coast, about 300 miles S.E. of Havannah, Baracoa, on the N.E. part of the island, with a convenient harbour for small vessels, and St. Jago, formerly the capital and the residence of its government.

This island commences on the east side at N. lat. $20^{\circ} 20'$, approaches on the north the tropic of Cancer, and extends

from W. long. $73^{\circ} 50'$, to $85^{\circ} 30'$, about $11^{\circ} 40'$, from east to west, or 690 geographical miles from Cape Antonio on the west, to Cape Mayzi on the east; but it is narrow, in proportion to its length, being in some parts not above 12 or 14 leagues, and at most but 120 miles in breadth. It contains about 38,400 square miles. It lies W. of Hispaniola, N. of Jamaica, and the bay of Honduras, E. of the meridian of Yucatan, and S. of the great bank of Bahama, and the Florida stream; and commands the entrance of both the gulfs of Mexico and Florida, and the windward passage; so that the Spaniards, who are the sole possessors of it, may with a tolerable fleet not only secure their own trade, but annoy their neighbours. The command of this island is entrusted with a governor, or captain-general, who decides all affairs, civil and military; and its finances are under the direction of an intendant. It is divided into 18 jurisdictions, each of which has a magistrate. A chain of mountains extends the whole length of the island from east to west, and divides it into two parts; but the land near the sea is in general level, and flooded in the rainy season. Like most islands in the West Indies, it is subject to storms, but the climate is, upon the whole, healthy, and even temperate; for though in this latitude there is no winter, the air is refreshed with rains and cooling breezes. The rainy months are July and August; the rest of the year is hot. The soil is equal in fertility to any in America, producing ginger, long pepper, and other spices; aloes, mastic, cassia, sassa, manioc, maize, cocoa, &c. Tobacco is one of its principal productions, and it is supposed to have the most delicate flavour of any produced in the New World. The cultivation of sugar has lately been introduced; but the indolence of the inhabitants renders it in every respect much less productive than it might otherwise be. The quantity of coffee is inconsiderable. Not more than 100th part of the island is cleared. The chief plantations are on the beautiful plains of Savannah, and are cultivated by about 25,000 slaves. The other inhabitants are said to amount to about 30,000. Among the trees are oaks, firs, palms, cotton trees, ebony, and mahogany. In 1763 bees were introduced by some emigrants from Florida, and they multiplied so much in the hollows of old trees, that they soon obtained enough for their annual consumption. In 1777 they exported honey to the amount of 715,000 pounds. The island abounds with mules, horses, sheep, wild boars, hogs, and fine black cattle. The horned cattle have increased so much that the forests are filled with droves of them, which run wild, and are hunted and killed for their hides and tallow. The chief birds are paroquets, turtle doves, and partridges; water-fowl are numerous; and on the coast turtles are abundant; mullets and shads are the principal fish. The copper-mines, which are in the eastern part of the island, furnish all the Spanish colonies with utensils of that metal; small pieces of gold and silver are collected in the sand of the rivers, which makes it probable that there are veins of these metals in the mountains. Few countries have better ports than Cuba; the most considerable and best known are the Havannah and St. Jago; which see.

CUBA, a town of Portugal, in the province of Alentejo; 3 leagues N.N.E. of Beja.

CUBA, in *Mythology*, a goddess among the Romans, thus called from *cubo*, I lie down, who was invoked in order to make children sleep.

CUBÆA, in *Botany*, Scop. Schreb. 702. Willd. 814. (Tachigali; Aubl. Tachigaha; Juss. 349.) Class and order, *decandria monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth one-leafed, top-shaped, spreading, permanent, five-parted; divisions roundish, concave; four erect; the fifth and lowest larger, declining. *Cor.* Petals five, oblong, nearly equal, furnished with claws, inserted into the neck of the calyx; three upper ones erect; two lower ones declining. *Stam.* Filaments ten, villous at the base, inserted into the calyx below the petals; three upper ones shorter, filiform, erect, close-pressed to the upper petals; the seven lower ones longer, capillary, longer than the lower petals, and incumbent on them; anthers oblong. *Pil.* Germ oblong, pedicelled; style capillary; stigma acute. *Peric.* Legume long, coriaceous, villous, swollen, obliquely acuminate, one-celled. *Seeds* several, somewhat kidney-shaped.

Eff. Ch. Calyx top-shaped, five-parted. Petals five, nearly equal, irregular. Stamens inserted into the calyx, long, all fertile, three upper ones shorter. Pericarp a legume.

Sp. 1. *C. paniculata.* Mart. 1. Willd. 1. Aubl. Guian. 1. 372. tab. 143. fig. 1. "Leaves pinnated; leaflets opposite." A tree sixty feet high, much branched at the top; smaller branches triangular. *Leaves* large, alternate; leaflets in six pairs, somewhat egg-shaped, acute, entire, green and smooth above, somewhat downy underneath, and of an ash-coloured green. *Stipules* two, opposite, at the base of the leaf-rib. *Flowers* very numerous, on short peduncles, in long terminal trigonous spikes, which form an ample panicle. 2. *C. trigona.* Mart. 2. Willd. 2. Aubl. tab. 143. fig. 2. "Leaves pinnated; leaflets alternate." Very similar to the preceding, and perhaps should be considered as a mere variety. Both kinds are natives of Guiana in woods, on the banks of rivers. The trivial name of the latter is ill chosen, the leaves in both having a triangular midrib.

CUBAGUA, in *Geography*, a small island about 8 miles long, near the coast of Cumana, in South America, between the island of Margarita and the continent, discovered by Columbus in the year 1498, and afterwards chiefly visited by the Spaniards for the sake of the pearls found on its coasts; but in 1524 the banks of pearls disappeared, and the fishermen, who were Indians from the Lucayos islands, were nearly exhausted. The soil is dry, barren, and nitrous, without fresh water, and producing little besides rushes. N. lat. $10^{\circ} 56'$. W. long. $63^{\circ} 30'$.

CUBAIMAROU, a river of the island of St. Vincent, which runs into the sea, in a bay of the same name, on the south coast of the island. N. lat. $13^{\circ} 6'$. W. long. $61^{\circ} 11'$.

CUBAN, or KUBAN, a province of the southern division of Russia, in Europe, is the government of Taurida, between the 45th and 47th degree of north latitude, bounded to the south by Circassia; to the west by the Black Sea, and the gulf of Taman; to the north and north-east by the sea of Afoph; and to the east by the government of Caucasus. It is a level and not very fertile country, inhabited chiefly by Tartars, who lead a wandering pastoral life on the banks of the Cuban, a considerable river, from which the country derives its name. Before their submission to the Russian empire, they had their particular khan or chief, and could bring 40,000 men into the field; but whole tribes of them have deserted, and gone over to the Turks. They are of Mongolian origin, and a very unsettled people. Their inclination to rob has not yet been changed, though they have been much reduced by severe, capital, and merited punishments.

The Cuban passed under the domination of Russia, at the same time with the *Crim* or *Crimea* (which see), in the year 1784, and in the last treaty with the Ottoman Porte, the river Cuban was fixed upon as the boundary of the Russian

empire in that quarter. This river falls into the Euxine or Black Sea. It is the *Hypanis* of the ancients. It rises in the Caucasian mountains, and is formed by the confluence of a number of small rivers. With the river Tumefek it makes several islands between the sea of Afoph and the Black Sea, of which one of the finest is the isle of Taman. A principal arm of the Cuban falls northward into the sea of Afoph, and the other southward into the Euxine. The river in general, and the first arm in particular, has a rapid course and clear water; but that arm which falls into the Black Sea, flows in a very gentle current, has a troubled water and forms at its mouth a pretty spacious bay, which however is so shallow that it can never serve as a haven.

The Cuban has neither rocks nor water-falls, and therefore is well adapted to being navigated with vessels that do not draw much water. It admits to the right the rivers Barakla and Barsukta; to the left the Yassik, Yassi, Urp, Sagraffa, Laba, Karabokan, and several other small rivers. In the mountainous part of the country, watered by the Cuban, its banks are very steep; but in the lower regions they are flat. Here the country is one continued Steppe, almost entirely destitute of wood, but in other respects tolerably fertile. The isle of Taman, which is considered as part of the Cuban, has an excellent, and in some districts ever verdant soil. See TAMAN.

The mountains in the superior regions of the Cuban are thickly covered with forests; and not far from this river, at a place called Athuel, is a lake of salt water. Tooke's View of the Russian Empire. P. S. Pallas's Travels through the Southern Provinces of the Russian Empire.

CUBATURE, or CUBATION, of a solid; the measuring of the space comprehended in a solid; as a cone, pyramid, cylinder, &c. or finding the solid content thereof. The cubature regards the content of a solid, as the quadrature does the superficies of a figure. See SOLID.

CUBBITTING, in *Farriery*. See CRIB-biting.

CUBBRIDGE-HEADS, in *Ship building*, is sometimes used for the bulk-heads of the fore-castle, and the half-deck: the first being called the *cubbridge-head before*; the other the *cubbridge-head abaft*.

CUBCABIA, in *Geography*, a considerable town of Africa, in the country of Darfûr, situated on the road from Cobbe to Bergoo, and containing many inhabitants. This town is the key of the western roads, and the depôt of all the merchandize that is brought from that quarter. A market is held here twice a week, in which the chief medium of exchange, for articles of small value, is salt, which the inhabitants make by collecting and boiling the earth of those places where horses, asses, or other animals have been long stationary. This market is celebrated for a quantity of "tokeas," and for the manufacture, if it may be so called, of leather, which they dexterously strip of the hair, tan, and then form into large sacks for corn, water, and other purposes. The "tokeas" are cotton cloths, 5, 6, or 8 yards long, and from 8 to 22 inches wide; they are strong but coarse, and form the covering of the whole lower class of both sexes. The inhabitants are partly Fûrians, who speak their own language, partly Arabs, and partly emigrants from some of the western countries, as Bergoo, &c. Brown's Travels in Africa, p. 238.

CUBDENSIS, in *Ancient Geography*, an episcopal see of Africa, in the proconsular province.

CUBE, in *Geometry*, a regular or solid body, consisting of six square and equal faces, or sides; and its angles all right, and therefore equal.

The

C U B E.

The word comes from *κῦβος, tessera, die.*

The cube is also called *hexahedron*, because of its six sides. The cube is supposed to be generated by the motion of a square plane, along a line equal to one of its sides, and at right angles to it: whence it follows, that the planes of all sections, parallel to the base, are squares equal to it: and consequently, to one another.

To describe a rete, or net, whence any given cube may be constructed, or with which it may be covered. On the right line A B (Plate III. Geometry, fig. 52.) set off the side of the cube four times: on A erect a perpendicular, A C, equal to the side of the cube A I, and complete the parallelogram A C D B: with the interval of the side of the cube, in the line C D, determine the points K, M, and O; lastly, draw the right lines, I K, L M, N O, and B D, produce I K and L M, each way to E and F, and to G and H; till EI=IK=KE, and GL=LM=MH, and draw the right lines E G, F H.

To determine the surface and solidity of a cube.—As the surface of a cube consists of six equal squares, a side multiplied by itself and the product by six, will give the superficies; and the same product, again, multiplied by the side, the solidity.

Hence, if the side of the cube be 10, the solidity will be 1000; if that be 12, this will be 1728: wherefore the geometrical perch being ten feet, and the geometrical feet twelve digits, &c. the cubic perch is 1000 cubic feet, and a cubic foot 1728 cubic digits, &c.

Hence, also, cubes are in the triplicate ratio of their sides; and are equal, if their sides be so.

CUBE, duplication of *a*. See DUPLICATION.

CUBE, scenography of *a*. See SCENOGRAPHY.

CUBE, or CUBIC number, in *Arithmetic*, is a number arising from the multiplication of a square number by its root: or, it is formed by multiplying any numbers twice by themselves. Thus, if the square number four be multiplied by its root two, the factum eight is a cube or cubic number; and the number two, with respect to it, a cube root.

Also, the cubes of

1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

are . . . 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000. Thus a table of cubes may be easily formed for any series of numbers.

Hence, since as unity is to the root, so is the root to the square; and as unity is to the root, so is the square to the cube: the root will, also, be to the square, as the square to the cube: that is, unity, the root, the square, and the cube, are in continual proportion; and the cube root is the first of two numbers that are mean proportionals between unity and the cube.

All cubic numbers, whose root is less than 6, *v. g.* 8, 27, 64, 125, being divided by 6, the remainder is their root itself. Thus, 8, being divided by 6, 2, the remainder of the division, is the cube root of 8. For the cubic numbers beyond 125, as 216, the cube of 6, divided by 6, leaves no remainder; 343, the cube of 7, leaves a remainder of 1, which added to 6 gives the cube root of 343. And 512, the cube of 8, divided by 6 leaves 2, which added to 6, makes the cube root of 512. So that the remainder of the divisions of the cubes above 216, divided by 6, being added to 6, always give the root of the cubic number divided, till that remainder be 5, and, consequently, 11 the cube root of the number divided: but the cubic number above this, being divided by 6, there remains nothing, the cube root being 12; thus, if you continue to divide the higher cubes by 6, you must not add the remainder of the division to 6 but to 12, the first multiple of 6, and thus

coming to the cube of 18: the remainder of the division must not be added to 6, nor to 12, but to 18; and so on *in infinitum*.

M. de la Hire, from considering this property of the number 6, with regard to cubic numbers, found, that all other numbers raised to any power whatsoever, had each their divisor, which had the same effect with regard to them that 6 has with regard to cubes. And the general rule he has discovered is this: if the exponent of the power of a number be even, *i. e.* if that power be raised to the 2d, 4th, 6th, &c. power, it must be divided by 2; and the remainder, if there be any, added to 2, or to a multiple of 2, gives the root of the number corresponding to its power, *i. e.* the 2d or 6th root, &c. But if the exponent of the power of the number be uneven, *i. e.* if it be raised to the 3d, 5th, 7th, &c. power, the duple of that exponent will be the divisor, which shall have the property here required.

It appears, from a due examination of the cubes of the natural numbers, that their third differences are all equal to each other, being the constant number 6. Let m^3, n^3, p^3 , be any three adjacent cubes in the natural series of cubes, that is, let them be such whose roots m, n, p , have the common difference 1; then because $n=m+1$, we shall have $n^3 = m^3 + 3m^2 + 3m + 1$; and because $p=n+1$, we shall have $p^3 = n^3 + 3n^2 + 3n + 1$; so that the differences between the 1st and 2d, and between the 2d and 3d cubes, are $n^3 - m^3 = 3m^2 + 3m + 1$ } the 1st difference, and the difference of these differences, *viz.* $3n^2 + 3n + 1 - 3m^2 + 3m + 1 = 3 \cdot n^2 - m^2 + 3 \cdot n - m = 3 \cdot n + m + 1 = 6 \cdot m + 1$, is the 2d difference. In like manner the next second difference is $6 \cdot n + 1$; and the difference of these two differences is $6 \cdot n - m = 6$, which is therefore the constant third difference of all the series of cubes. And hence that series of cubes will be found by addition only; *viz.* by adding always the 3d diff. 6 to find the column or series of 2d differences, and adding these always for the first differences, and again adding these always for the cubes themselves, thus:

3d Differences.	2d Differences.	1st Differences.	Cubes.
6	6	1	0
6	12	7	1
6	18	19	8
6	24	37	27
6	30	61	64
6	36	91	125
6	42	127	216
6	48	169	343

Peletarius, among various speculations concerning square and cubic numbers, shews that the continual sums of the cubic numbers, whose roots are 1, 2, 3, &c. form the series of squares whose roots are 1, 3, 6, 10, 15, 21, &c.

Thus: $1 = 1 = 1^2$
 $1 + 8 = 9 = 3^2$
 $1 + 8 + 27 = 36 = 6^2$
 $1 + 8 + 27 + 64 = 100 = 10^2, \&c.$

Or, in general, $1^3 + 2^3 + 3^3 + 4^3, \&c. \text{ to } n^3 = \frac{1}{2} n \cdot n + 1$. It is also a property of these cubic numbers, that any number, and the cube of it, being divided by 6, leave the same remainder; the series of remainders being 0, 1, 2, 3, 4, 5, continually repeated. Or, that the differences between the numbers and their cubes,

This name was also given to the balcony or loggia, in which the emperors were placed at the public games.

CUBIDIA, in *Natural History*, the name of a genus of spars. The word is derived from $\kappa\upsilon\beta\acute{\omicron}\varsigma$, a die, and is given them from their being of the shape of a common die, or of a cubic figure. These bodies owe this shape to an admixture of particles of lead, and there are only two known species of the genus. 1. A colourless crystalline one, with thin flakes, found in the lead mines of Yorkshire, and some other parts of the kingdom. And, 2. A milky-white one, with thicker crusts. This is found in the lead-mines of Derbyshire and Yorkshire, but is usually small, and is not found plentifully.

CUBII, in *Ancient Geography*, a people placed by Ptolemy in the vicinity of the Marzotide lake.

CUBING of a Solid. See **CUBATURE** and **SOLID**.

CUBIT, a long measure, used by the ancients, especially the Hebrews; taken from the ordinary extent of a man's arm, between the elbow and the tip of the hand.

In the Scripture, we find cubits of two lengths; the one equal, according to Dr. Arbuthnot, to 1 foot 9 inches $\frac{3}{8}$ of an inch, our measure; being the fourth part of the fathom, double the span, and six times the palm: the other equal to 1 $\frac{3}{4}$ foot, or the four hundredth part of a stadium. The Romans, too, had a cubit, equal to 1 English foot, 5 inches, $\frac{4}{8}$ of an inch. F. Merfenne makes the Hebrew cubit 1 foot, 4 digits, and 5 lines, with regard to the foot of the Capitol. According to Hero, the geometrical cubit is 24 digits; and, according to Vitruvius, the foot is $\frac{2}{3}$ of the Roman cubit, *i. e.* 16 digits, or finger's-breadth. The cubit was a measure of length used in England in the earlier period of its history, when the different parts of the body, &c. were resorted to as measures on different occasions, without much regard to their exact relation to each other, but which subsequent writers have thus stated. The English cubit or fore-arm = 864 hairs' breadth = 54 barley corns = 24 digits or finger's breadths = 18 inches = 16.8895 French pouces, or thumb's breadths = 8 nails = 6 palms, or hand's breadths = 4 $\frac{1}{2}$ hands, or clenched fist's breadths = 2 spans = 1 $\frac{1}{2}$ foot = $\frac{1}{2}$ a yard, or whole arm = $\frac{2}{3}$ pace or step = $\frac{2}{3}$ English ell or arm = $\frac{1}{4}$ fathom, or arm's reach = $\frac{1}{4}$ pole, or rod = 2 27 27 links = .2346 toise of France = .4570 metre of France.

CUBITÆUS EXTERNUS, or *ulnaris*, in *Anatomy*, the first of the extensor muscles of the fingers; thus called, as being placed along the cubitus externally. It rises from the external protuberance of the humerus, and, passing its tendon under the *ligamentum annulare*, is inserted into the fourth bone of the metacarpus, that sustains the little finger. See **ULNARIS extensor**.

CUBITÆUS INTERNUS, the first of the flexors, placed along the cubitus, withinside the arm. It rises from the internal protuberance of the humerus, and part of the ulna; upon which it runs along till it passes under the *ligamentum annulare*, and is inserted by a strong and short tendon into the fourth bone of the first order of the carpus.

CUBITALIS, from *Cubitus*; is an adjective used sometimes in naming parts which are connected with, or adjacent to, the ulna; hence we have a cubital artery and nerve, and cubital muscles.

CUBITA BICEPS. See **BICEPS**.

CUBITUS, a term applied to the ulna.

CUBITUS, *fractured and luxated*. See **FRACTURE** and **LUXATION**.

CUBITUS, a measure of length, adopted by Linnæus for describing the dimensions of plants = 17 French inches = 204 lines = 18.11775 English inches = 1.50981 English feet.

CUBLANC, in *Geography*, a small town of France, in the department of the Correze; 12 miles S.W. of Brives.

CUBO-CUBO-CUBUS. See **CUBUS-CUBI**.

CUBO-CUBUS, the term whereby Diophantus, Vieta, &c. distinguish the sixth power; which the Arabs call *quadratum cubi*.

CUBOIDES OS, in *Anatomy*, one of the bones of the tarsus. See **SKELETON**.

CUBROS GEZIRA. See **GEZIRA Cubros**.

CUBUS-CUBI, a name whereby the Arab writers, and those who follow them, denominate the ninth power, or a number multiplied eight times by itself continually; which Diophantus, and after him Vieta, Oughtred, &c. call *cubo-cubus*.

CUCADMA, or **CUCUNDA**, in *Ancient Geography*, a town of Asiatic Sarmatia, placed by Ptolemy near the river Burens.

CUCANA, in *Geography*, a town of Italy, belonging to the state of Venice, in the country of Friuli; 7 miles W. of Palma la Nuova.

CUCASBIRI, in *Ancient Geography*, one of the fortresses of Thrace, constructed by Justinian in the province of Rhodope.

CUCCHIARA, in *Geography*, a small island in the Adriatic, near the coast of Naples; 6 leagues N.W. from Vieta.

CUCCI, or **CUCCUM**, in *Ancient Geography, a place of Pannonia, near the Savus, placed, in the Itinerary of Antonine, between Bononia and Cornacum; and supposed to be the present Cerolicka or Curufca.*

CUCHECUNNA, in *Geography*, a town of Asia, in the country of Candahar; 68 miles W.N.W. of Candahar.

CUCKFIELD, a market-town in Suffex, in the Rape of Lewes, is situate in a high and commanding situation, although it is built upon the lowest stratum in the series, which any where makes an extent of surface, in the road between London and Brighton. About two-thirds of a mile south of the town, this stratum produces a quarry of tolerable free-stone, with which anciently the town was built; it is a yellowish stone, whose grit is exceeding fine, and the lower beds in the quarries have numerous black ferruginous septa or joints between the stone; under which is a pipe-clay stratum, producing wood-coal in detached pieces (see **COAL** and **COLLIERY**); and this clay it seems to be, which holds up the water in the very dislocated and porous district in which this town stands, and supplies the wells therein with water, but rather scantily. This is a neat pretty town, the foot-paths being paved with red paving-bricks, of a very fine and durable quality, manufactured from a stratum of red pottery clay, which appears about four miles south of this town. Some parts of the stone found in this Cuckfield stone stratum, are separated by layers of mica, which fits it for splitting, so thin, as formerly to have been much used for slating buildings; other parts are separated by curious wavy joints, that present matter of curious speculation to the naturalist. The land round this town, particularly on the south side, is of good quality. The spire of this church is furnished with a conductor, and, like most others in Suffex, is covered with wooden shingles, which have assumed a blue cast, exactly resembling slate in colour and appearance. Its situation was determined in the government trigonometrical survey in 1793, by an observation from Ditchling station, distant 38,568 feet, and bearing 12° 20' 25" S.E. from the parallel to the meridian of Greenwich, and another from Chanctonbury ring, distant 67,789 feet; whence is deduced its latitude 51° 0' 18."3 N., and longitude 0° 8' 29."8, or 34' W. of Greenwich.

CUCKING.

CUCKING STOOL, COKESTOOL, or CASTIGATORY, anciently called *tumbrel* and *trebucket*; an engine for the punishment of scolds and iniquit women, by ducking them in the water. It is frequently corrupted into *ducking-stool*, because the residue of the judgment is, that when they are placed in it, they shall be plunged in the water for their punishment.

Kitchen says, "Every one having a view of frank-pledge, ought to have a pillory and a tumbrel." This machine was much in use, even among our Saxon ancestors, who called it *scolding-stole*, or *scolding-stool*.

The punishment was anciently also inflicted on brewers, and bakers, transgressing the law; who were thereupon, in such a stool or chair, to be ducked in *stercore*, some muddy or stinking pond. This was anciently written *gazing-stool*; in Domesday it is called *cathedra stercoris*.

CUCKMERE, in *Geography*, a river of England, which runs into the sea, 3 miles W. of Beachy head.

CUCKOLD'S POINT, a cape on the E. coast of the island of Barbadoes. N. lat. 13° 32'. W. long. 58° 25'.

CUCKOW, in *Ornithology*. See **CUCULUS**.

CUCKOW, *green yellow bellied*, of Edwards. See **TROGON Curucui**.

CUCKOW-Flower, in *Botany*. See **CARDAMINE pratensis**.

CUCKOW-Flower, in *Agriculture*, is the name of a plant, the (*lychnis flosculi*), which is a common weed in meadows and pastures. It is likewise denominated meadow cuckow-flower, meadow plinks, rugged robin, &c.

CUCKOW-Lamb, in *Rural Economy*, is a name applied in some districts to such a lamb as is yearned in April, or the following month, because it falls in what is termed cuckow-time. These are generally either the lambs of very young or very old ewes, occasioned by their taking ram late in the season. These lambs are usually of the weakest and smallest sort, and therefore both the ewes and lambs should have the best keep, in order to fatten the lambs for the butcher; as such diminutive lambs are improper to be kept for more-sheep flock in most cases, except where necessity obliges the farmer to have recourse to them.

CUCKOW Pint, in *Botany*. See **ARUM**.

CUCKOW-Spit, in *Agriculture*, a name sometimes applied to the frothy substance which is occasionally observed on plants, and which is supposed to afford protection to insects from the heat of the sun, and the attacks of the spider. But it has been supposed by Mr. Lise to be nothing more than the nocturnal dew which descends upon the fork or joint of the plant, and which is worked into a froth by the insects.

CUCKSOO. See **COOSCOOSOO**.

CUCQ, in *Geography*, a small town of France, in the department of the Pa'n, 18 miles N.E. of Caltres.

CUCUBALUS, in *Botany, (Plin.) Tournefort, Cl. 8. § 1. gen 3. Gært. 491. Smith Flor. Brit. 2. 464. Clafs and order, *deandria trigynia*. Nat. Ord. *Caryophyllei*; Linn. and Juss.*

Gen. Ch. *Cal.* one-leaved, inflated, five-cleft half way down, permanent. *Cor.* Petals five; claws nearly the length of the calyx, generally more or less crowned; expansion semibifid. *Stam.* Filaments ten, awl-shaped, inserted alternately into the claws of the petals; anthers oblong. *Pist.* Germ pedicelled, globular, smooth; styles linear, villous their whole length on the interior side; stigmas acute. *Peric.* Berry black, shining, spherical, soft, pulpy, not dehiscent, at first three-celled, but afterwards the partitions shrivel up, and disappear. *Seeds* numerous, attached to a free central receptacle.

Eff. Ch. Calyx one-leaved, inflated. Petals five, furnished with claws. Berry superior, finally one-celled. Seed numerous.

Sp. *C. bacciferus*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Eng. Bot. 1577. Gært. tab. 77. fig. 7. (*Silene baccifera*; Willd. *Silene fifia*. Salisb. Prod. 302. *Cucubalus* Plinii; Lugdb. 1429. Tourn. 339. Dill. in Rai. Syn. 257. Alone scandens *baccifera*; Bauh. pin. 250. *Viscago*; Hall. Helv. n. 912. *Lychnanthus volubilis*, Gmel. in Act. Petrop. 1759. v. 14. 225. tab. 17. fig. 1.) Berry-bearing chickweed. *Root* perennial, creeping. *Stems* several, annual, three feet long, weak, straggling, much branched, dichotomous, cylindrical, hollow, rough with deflexed hairs. *Leaves* opposite, petioled, widely spreading, egg-shaped, acute, entire, pubescent, pale green, resembling those of *stellaria nemorum*. *Flowers* axillary and terminal; calyx large, bell-shaped, membranous, pubescent; segments reflexed as the fruit ripens; petals greenish-white, distant. A native of France, Italy, Switzerland, Germany, &c.; admitted as an English plant by Dillenius into his edition of Ray's Synopsi, on the authority of specimens sent to Dr. Richardson by Mr. Fowlkes of Llanbeder, near Ruthin, and said to have been gathered in the island of Anglesea; but no other botanist has been fortunate enough to find it there, or in any other part of Great Britain.

Obs. The only essential difference between this genus and *silene*, as settled by Linnæus, and received by most succeeding botanists, is the want of a crown to the claws of its petals. It has been justly observed by La Marck, that this distinction is not only purely arbitrary, and separates plants which are closely united by other natural character; but also that it is in itself by no means in all cases sufficiently clear and determinate; the crown being occasionally obsolete in some plants, which generally have it distinctly marked, and always so small in others, as to make it scarcely visible, and to occasion a doubt to which genus the plant ought to be referred. He adds, but rather inconsistently, that he has retained the Linnæan distribution solely for the sake of facilitating the study of the species, as those already arranged under *silene* are very numerous, and difficult to determine. Gærtner and Dr. Smith have restored Tournefort's original generic character of *cucubalus*, and considered the plant before us as the only species hitherto known. We adopt without hesitation the idea of these eminent botanists, and refer all the species which have a real capsule to the genus *silene*.

CUCUJUS, in *Entomology*, a genus of coleoptera, established by Fabricius, and adopted by Gmelin, in the last edition of the Linnæan Systema. The character of the genus, after the Linnæan method of classification, consists in having the antennæ filiform; feelers four, and equal, the extreme joint truncated, and thicker; lip short, bilid, with linear distant divisions; and the body depressed.

Three of the species belonging to the present genus were known to Linnæus; these are, *depressus*, *cæruleus*, and *flavipes*. The first he considers as a *cantharis*, and describes under the specific name of *sanguinolenta*: the *cæruleus* is the *tenebrio depressus* of that author, and the *flavipes* his *cerambyx planatus*. Swederus gives two new species (*maculatus* and *rufus*), in the Stockholm Transactions, the rest were described originally from various cabinets by Fabricius, who, with much propriety, embodied this natural tribe into a distinct genus. The essential or generic character laid down by Fabricius, is chiefly taken, as usual in the System of that author, from the structure of the mouth; the four equal feelers having the extreme joint truncated, and thicker; the short bifid lip with linear distant

tant divisions; and the antennæ being moniliform and filiform, constitute the Fabrician character of the cucujus genus.

Species.

DEPRESSUS. Thorax denticulate, and with the wing-cases rufous; legs simple and black. Fabr. *Cantbaris sanguinolenta*, Linn.

The antennæ are hairy and black; head depressed with an obtuse-angular globule each side. A native of Germany, according to Frisch and Hattorf.

SULCATUS. Thorax grooved, black; wing-cases marked with crenated striæ.

Found in putrescent wood in Croatia. Saldoner.

RUFIPES. Thorax fulcated; wing-cases black and punctured; antennæ and legs ferruginous.

This is the largest species of its genus, and is found in rotten or decaying wood in Barbary. The antennæ are pale ash, with the first joint black; thorax narrowed behind, and marked with three distinct grooves.

CÆRULEUS. Thorax fulcated and black; wing-cases striated and blue; abdomen rufous. Fabr. *Tenebrio depressus*, Linn.

Found in Germany. The head is black, with the mouth piceous; legs black.

FESTIVUS. Thorax fulcated, black; wing-cases striated, blue; margin of the abdomen, and flanks rufous.

Inhabits the same country as the preceding, and is about half its size.

CASTANEUS. Thorax fulcated, black; wing-cases striated; margin of the abdomen and the legs testaceous.

Described from the cabinet of Smidt as a native of Germany.

DUBIUS. Thorax denticulated and rufous; wing-cases black; antennæ filiform, and the length of the body. Fabr.

Native of North America. The antennæ are very long, and flexuous, with the last joint acute, in which latter particular it differs from the rest of the genus; it does not appear to us as strictly appertaining to this genus.

FLAVIPES. Thorax denticulate and black; legs yellowish; antennæ length of the body. Fabr. *Cerambyx planatus*, Linn.

Inhabits northern Europe, and preys on bark of trees.

DERMESTOIDES. Thorax fulcated, and fuscous; wing-cases smooth and testaceous.

A small species found in Germany. The antennæ are short. Thorax marked with two grooves. Smidt.

TESTACEUS. Thorax somewhat square, unarmed; body testaceous; thighs compressed.

Inhabits Europe, and is found under the bark of the birch tree.

MUTICUS. Thorax unarmed and black, with an impressed dot each side; wing-cases fuscous and striated.

Found in Germany. Hattorf.

MONILIS. Thorax unarmed, black; margin with spots on the wing-cases, ferruginous.

A native of Germany.

RUFUS. Rufescent; antennæ, feelers, and legs black; head gibbous; wing-cases softish. Swederus Nov. Act. Stockh. Inhabits the island of Sumatra.

MACULATUS. Sordid yellow; thorax unequal, squarish; legs, and subquadrangular spot on the wing-cases, black. Swederus.

CUCULARIS MUSCULUS, in *Anatomy*, a name under which the trapezius muscle is frequently described.

CUCULLA, a cowl. See **ABBOT**, and **COWL**.

CUCULLANUS, in *Natural History*, a genus of worms

which infest the intestines of various quadrupeds, birds, and fishes. The character of the genus consists in the body being sharp-pointed behind, and obtuse before: the mouth orbicular, with a striated hood. Several species and varieties of these destructive creatures have been detected by the continental naturalists, especially by Goeze and Müller, who observed most of them to be viviparous.

Species.

* *Infesting the Mammalia.*

TALPÆ. Inhabits the common mole of Europe.

This sort is gregarious, and lives enclosed in a membrane spirally twisted in the fat about the peritonæum. Goeze.

OCREATUS. Body fasciolated; tail sheathed.

Found by Goeze in the intestines of the mole; this creature is believed to be of the oviparous kind; it resembles a piece of straw, is about two inches in length, and lives in clusters or societies.

MURIS. In the lesser intestines of the mouse. Goeze.

** *Infesting Birds.*

BUTEONIS. Inhabits the intestines of the buzzard. Goeze.

*** *Infesting Reptiles.*

RANÆ. Tail foliaceous.

Infests the intestines of the frog.

**** *Infesting Fishes.*

LACUSTRIS. Body rufous, the anterior part truncated. Müll.

Several varieties of this kind of worms are described by writers. Goeze speaks of one (*var. α*) peculiar to the conger eel; another (*perca*) to the river perch, and a third (*lucio-perca*) to the perca lucio-perca. Müller and Pallas observed another variety (*cernua*), in the ruffe, and Goeze two others, one in the salmon (*farionis*), and another in the trout (*fularis*). All these are very fertile, and generally infest the intestines; the last mentioned kind is found also in the liver.

ASCAROIDES. Head orbicular, and hooked each side; tail rounded, short, and pointed, with two exerted spicules.

Infests the stomach of the *silurus glanis*. These are about an inch long, of a greyish-white colour, resemble the maggot of a musca fly, and live together in clusters.

MURINUS. Yellowish-ash, obtuse in front. Müll.

There are two varieties of this kind, *cirratus* and *muticus*, the first of which, as the name implies, is furnished with cirri, the other is unarmed; these are oviparous, and are found in the intestines of the common cod-fish. The body of this species is long, flexuous, round, pellucid, and very finely striated across; the head broad, gut orbicular, and appearing as if burnt on the fore part. The male is armed with blackish, setaceous, bicuspidate prickles at the tail, near the vent; female distinguished by a tuberculate aperture in the middle of the body.

CUCULLARIA, in *Botany*. Schreb. 11. Willd. 16. Class and order, *monandria monogynia*.

Gen. Ch. *Cal.* Perianth one-leaved, deeply four-parted; segments roundish, unequal; two upper ones smaller, divaricated. *Cov.* Petals four, unequal, inserted into the calyx; upper one ascending, wedge-shaped, hollowed, emarginate; lower one larger, inversely egg-shaped, rounded, concave; two lateral ones smaller, vertical, oblong, covered on the lower side by the larger petal; claws broad, short. *Ned.* at the base of the upper petal, corniculate, long, incurved,

curved, obtuse, prominent between the upper distant segments of the calyx. *Stam.* Filament solitary, petal-shaped, oblong, growing broader before, cowl'd at the top, inserted into the bottom of the calyx below the germ, longer than the lower petal, and incumbent on it; cells of the anther two, separated, linear, adnate to the filament within the cowl. *Pist.* Germ egg-shaped, three-furrowed; style filiform, recurved, incumbent on the upper petal; stigma flat upwards, curved below. *Peric.* three-celled. *Seeds* numerous.

Eff. Ch. Calyx four-parted. Petals four, unequal, upper one spurred. Filament petal-shaped. Anther with separated cells.

Sp. C. excelsa. Willd. (*Vochoy guianensis*; Aub. Guian. 1. 18. tab. 6.) A lofty tree. *Leaves* opposite, inversely egg-shaped, acute, veined. *Flowers* yellow, in terminal racemes. A native of Guiana. *C. excelsa* of Vahl is a different species. See *Annals of Botany*, vol. ii. p. 185.

CUCULLARIA; Buxb. See *VALANTIA cucullaria*.

CUCULLATE FLOWERS, among *Botanists*, are such as resemble a *cucullus*, or monk's hood, or cowl. See *CUCULLUS*.

CUCULLUS was anciently a traveller's cap; called also *cowl*, *goul*, or *gula*: whence the name passed to the monks, among whom it signified their frock and cap, which were of one piece.

CUCULLUS, in *Botany*, is used by professor Willdenow to express a peculiar kind of *Nectarium*, or honey-bag, quite distinct from the other parts of the flower, as in *Aconitum*, or Monk's Hood, in which the part in question is double, standing on a pair of stalks, and looking like a couple of little birds. In *Aquilegia*, the columbine, there are five honey-bags, ranged alternately with the petals. The term is also applied, by the same author, to a very different organ, whose nature has not generally been understood, in the *Asclepias*. The anthers in this genus grow out of the stigma, so that none can be more truly gynandrous. They consist of a pair of masses of naked conglutinated pollen, as in the *Orchis* family, and the *cucullus* of Willdenow is a membranous case, or *lamina*, proceeding from the base of the flower, where stamens are usually inserted, and serving to cover and shelter the anther, with which, however, it is totally unconnected. S.

CUCULUS, in *Ornithology*, the cuckow genus. These are of the *picæ* order; their bill is smooth, and a little curved; nostrils surrounded by a small rim; tongue sagittate, short, and pointed; feet formed for climbing. As a secondary character, it may be added, that the toes are usually placed two forward, and two backward, and the tail cuneated, and consisting of about ten soft feathers.

Species.

CAPENSIS. Greenish-brown; beneath white lined with black; cheeks, chin, throat, tail, and upper wing-coverts rufous; tail-feathers white at the tips. *Cuculus capensis*, Gmel. *Coucou du Cap de Bonne Esperance*, Buff. *Édolio*, Kolb. Cape cuckow, Lath.

One of the species of cuckow, found at the Cape of Good Hope; its length is about twelve inches; bill and legs brown, the irides yellow.

GLANDARIUS. Tail wedge-shaped; head somewhat crested; wings brown spotted with white and cinereous; band over the eyes black. *Cuculus glandarius*, Linn. *Cuculus Andalusie*, Briff. *Le grand coucou tacheté*, Buff. Great spotted cuckow.

This is the size of the magpie. The bill is black; crest bluish-ash; shoulders, upper wing, and tail-coverts brown

spotted, quill-feathers brown; tail blackish, with the tips white. Inhabits Andalusia.

CANORUS. Cinereous; beneath whitish, transversely streaked with brown; tail rounded, blackish, dotted with white. *Cuculus canorus*, Linn. *Cuculus*, Geln. *Il cuculo*, Olin. *Coucou*, Buff. *Kuckuck*, Wirling. Common cuckow.

This is the cuckow common to the British isles, and which extends also throughout most part of Europe, Asia, and Africa. The length of this bird is about fourteen inches, the bill black, and two thirds of an inch long; the plumage in general cinereous, transversely barred with deep brown or black streaks; the two middle tail-feathers black, with the tips white, the rest marked with white spots on each side the shafts, and the legs short and yellow. The female differs a little from the male, the neck both before and behind being of a brownish-red, the tail barred with the same colour, and black, and spotted on each side the shaft with white. The young are brown mixed with ferruginous and black.

Those birds feed principally on insects, or when brought up from a young state, as they sometimes are, they will eat bread and milk, fruit, eggs, and flesh, either cooked or raw. It is well known that the cuckow does not hatch its own eggs, but deposits the eggs in the nests of some other birds, generally those of the hedge-sparrow, water wagtail, or yellow hammer, and leaves the care of the young to their foster parents. The cuckow comes into England about the middle of April, or at least its note of love is heard for the first time in the season about that time. It is only the male that sings, and his note ceases before the end of July, though the cuckows do not take their final leave till the end of September, or beginning of October. They migrate from the north of Europe at the close of summer, and pass the winter in the warmer parts of Africa.

The rufous cuckow, *le coucou roux* of Brisson, is a variety of this bird.

TAITENSIS. Fuscous spotted with ferruginous; beneath hoary white, longitudinally striated with fuscous; tail cuneated, and marked with numerous ferruginous brown bands. *Cuculus taitensis*, Mus. Carl. *Cuculus taitius*, Gmel. *Ara wereroa*, Cook's Voyages. *Le coucou brun varié de noir*, Buff. Society cuckow, Lath.

About the size of a magpie, and nineteen inches long; it inhabits Otaheite, where it is called by the natives *arevareva*. The same species is also found in New Zealand and Tongataboo.

MINDANENSIS. Tail rotundate; body golden-green spotted with white; beneath white, undulated with blackish. *Cuculus Mindanensis*, Linn. *Le coucou varié de Mindanao*, Buff. Mindanao cuckow.

Larger than our common cuckow, and measures fourteen inches and a half. It inhabits Mindanao, and other of the Philippine islands.

SCOLOPACEUS. Tail wedge-formed; body clouded with grey and brown. *Cuculus scolopaceus*, Linn. *Le boutfallik*, Buff. *Coucou tacheté de Bengale*, Pl. Enl. Brown and spotted Indian cuckow, Edwards. Indian spotted cuckow, Lath.

Length fourteen inches. This species inhabits Bengal. The bill is dirty yellow-green; the plumage on the upper part rufous, with the feathers edged with brown; wing-coverts white, edged with brown; quills and scapulars transversely striated with brown, and rufous; tail cuneiform, seven inches and a half in length, subrufous, and crossed with oblique broad bands and brown; legs dirty greenish-yellow. In Bengal this bird is known by the name of Boutfallick.

MACULATUS.

CUCULUS.

MACULATUS. Tail elongated; body grey-green, glossed with fuscous, and variegated with white spots; beneath fasciated with brown and white; head black. *Coucou tacheté de la Chine*, Buff. Chinese spotted cuckow. Lath. Syn.

Inhabits Bengal and China; length fourteen inches.

PUNCTATUS. Tail cuneiform; body blackish dotted with rufous, beneath rufous streaked with black; tail-feathers banded with rufous. *Cuculus punctatus*, Linn. *Coucou brun piqueté de roux*, Buff. Rufous spotted cuckow. Lath.

Larger than the common cuckow. The female differs in having the rufous spots on the upper part less numerous than in the male, and the under surface paler. The species is found in the East Indies, and in the Philippine islands.

PANAYUS. Tail entire; body fuscous, with yellowish-rufous spots beneath, and tail banded with rufous and black; thorax black spotted with yellow. *Cuculus panayus*, Gmel. *Coucou tacheté de l'isle de Panay*. Son. Panayan spotted cuckow. Lath.

Inhabits the island of Panay. The beak is black; irides yellow; legs lead colour.

ORIENTALIS. Tail rotundate; body black, glossed with green; bill fuscous. *Cuculus orientalis*, Linn. *Cuculus indicus niger*, Briss. *Le Coucouel*, Buff. *Coucou noir des Indes*, Pl. Enl. Eastern black cuckow, Lath.

Size of a pigeon; length sixteen inches; bill and legs greyish. A native of India. A variety of this bird about fourteen inches in length is found in Mindanao, and another not longer than a blackbird in Bengal.

INDICUS. Tail rounded; body black; wings, and tip of the tail with three irregular transverse white lines. *Cuculus Indicus*, Gmel. Eastern black cuckow. Lath.

Inhabits India, flies in flocks, and feeds on insects. Length sixteen inches. Bill strong and whitish; legs blueish.

VETULA. Tail cuneated; body brownish, beneath testaceous; eye-lids red. *Cuculus vetula*, Linn. *Cuculus Jamaicensis longirostris*, Briss. *Le coucou à long bec*, Tacco, Buff. Long-billed rain cuckow, Lath.

Found in Jamaica, where it frequents woods and hedges all the year round; and feeds on seeds, small worms, and caterpillars, as well as the smaller kinds of serpents, frogs, lizards, and small birds. This bird is of such a gentle disposition, as to suffer the negro children to catch it with their hands. Its length is fifteen inches. This bird is said to be unusually noisy before rain, whence it has obtained the name of rain-cuckow, or long-billed rain-cuckow.

PLUVIALIS. Olive-ash, beneath rufous; chin and throat white. *Cuculus pluvialis*, Gmel. *Cuculus Jamaicensis*, Briss. *Picus major leucophæus*, Raii. *Le coucou dit vieillard*, Buff. Rain cuckow. Lath.

Inhabits the same country as the last; length from sixteen to seventeen inches long, and sings before rain. Both this and the former species are known in Jamaica by the name of Old Man.

MINOR. Olive-ash, beneath reddish; chin white. Mangrove cuckow.

Length twelve inches; its general appearance much resembling the rain-bird. It inhabits Cayenne, and lives on insects, especially those large caterpillars which feed on the leaves of the mangrove.

SERRATUS. Tail cuneiform; head crested; body black and glossy; on the wing a white ferrated spot. *Cuculus serratus*, Mus. Carl. Crested black cuckow. Lath.

Inhabits the Cape of Good Hope. This bird is twelve

inches and a half in length; the tail rather longer than the body; plumage of the thighs lax and long; legs black.

SENEGALENSIS. Tail cuneated; body grey, beneath white; cap and tail-feathers blackish. *Cuculus Senegalensis*, Linn. *Coucou du Senegal*, Pl. Enl. *Rufalbin*, Buff. Straight-heeled cuckow. Lath. Syn.

The length of this bird is fifteen inches and a half, its bulk exceeding that of our common cuckow. This bird inhabits Senegal. The bill is black; rump and upper tail-coverts brown, with deeper streaks; quill-feathers rufous, with brownish tips; legs grey; the inner hind-claw straight and longer.

BENGALENSIS. Ferruginous with white lines; beneath yellowish brown; tail cuneated. *Cuculus Bengalenfis*, Gmel. Lark-heeled cuckow. Brown Illustr.

Rather larger than a lark, and, like that bird, having the hind toe furnished with a long straight claw. This curious species inhabits Bengal.

HONORATUS. Tail cuneated; body blackish, spotted with white, beneath barred with white, and cinereous. *Cuculus honoratus*, Linn. *Cuculus Malabaricus navius*, Briss. *Cuil*, Buff. *Coucou tacheté de Malabar*, Pl. Enl. Sacred cuckow.

Inhabits Malabar, and being a great enemy to snakes and other noxious reptiles, is held sacred by the natives. Its length is eleven inches and a half.

PUNCTULATUS. Tail cuneated; body brown, the tips of the feathers sub-rufous; beneath dirty-white. *Cuculus punctulatus*, Gmel. Punctated cuckow. Lath.

Native of Cayenne; length nine inches.

GUIRA. Crested, yellowish-white; tail and wings brown; head brown in the middle, yellowish at the sides; neck yellowish in the middle, and brown at the sides. *Cuculus guira*, Gmel. *Guira acangatarata*, Raii. *Le guira cantara*, Buff. Brazilian crested cuckow. Lath.

Found in the woods of Brasil. The bill is yellowish; irides fuscous; and the legs sea-green.

AMERICANUS. Tail cuneated; body above cinereous, beneath white; lower mandible pale yellow. *Cuculus Americanus*, Linn. *Cuculus carolinensis*, Briss. *Le vieillard à ailes rouffes*, Buff. *Coucou de la Caroline*, Pl. Enl. Carolina cuckow. Catesby.

Length twelve inches. Inhabits Carolina, principally in woods.

PISANUS. Tail cuneated; body above varied with white and black, beneath white; head black, crested; chin and breast rufous. *Cuculus pisanus*, Gmel. Pisan cuckow. Lath.

Taken at Pisa in the year 1739. Its size rather exceeds that of the common cuckow.

MELANOLEUCOS. Black, beneath white; tail cuneated with the tip white; wings with a white spot; head sub-crested. *Cuculus melanoleucus*, Gmel. *Jacobin huppé de Coromandel*, Buff. Coromandel crested cuckow.

Length eleven inches. A native of Coromandel. The bill is black; legs fuscous.

MADAGASCARIENSIS. Olive-waved with brown, beneath tawny, chin olive-yellowish. *Cuculus Madagascariensis*, Gmel. *Coucou verdâtre de Madagascar*, Buff. Great Madagascar cuckow. Lath.

Measures twenty-one inches and half in length. The species inhabits Madagascar.

CHRYSOCEPHALUS. Head yellow; breast and shoulders lead colour; quill-feathers black; tail yellowish-brown, with numerous black bars. Gmel.

Inhabits South America.

DOMINICUS. Tail wedged; body grey-brown, beneath whitish;

CUCULUS.

whitish; three lateral tail-feathers white at the tip. *Cuculus dominicus*, Gmel. *Le cendrillard*, Buff. St. Domingo cuckow. Lath.

Inhabits St. Domingo, Guiana, and Louisiana. Length ten inches.

CAYANUS. Tail wedged; body purplish-chestnut; beneath cinereous; tail-feathers white at the tip. *Cuculus Cayanus*, Linn. *Coucou piaye*, Buff. Cayenne cuckow. Lath.

Found near rivers in Cayenne. The length is sixteen inches: it is of a docile disposition, and easily tamed. The legs and claws are grey-brown; quill-feathers brown at the tips; tail chestnut, and ten inches long. There are two varieties of this species, one of which is purplish beneath, and measures only ten inches and a half long. The other has the bill red; head cinereous; chin and breast rufous, and belly cinereous black.

TRANQUILLUS. Black, beneath inclining to cinereous; tail cuneated, upper wing-coverts edged with white. Gmel. Cayenne black cuckow.

Length eleven inches; bill and irides red. This bird is of a solitary nature, and inhabits Cayenne.

TENEBROSUS. Black; belly and thighs rust colour; rump and vent white; tail cuneated. *Cuculus tenebrosus*, Pallas. *Le petit coucou noir de Cayenne*, Buff. White-rumped black cuckow. Lath.

Inhabits Cayenne, where it frequents trees growing near the water side; it builds in hollow trees, or on the ground, and feeds on insects. Length eight inches and a half.

PYRRHOCEPHALUS. Black, beneath white; crown scarlet, surrounded by a circle of white; tail long, with the tip white. *Cuculus pyrrhocephalus*, Zool. Ind. Red-headed cuckow.

Frequent in the woods of Ceylon. The bill is curved, of a greenish-yellow colour; head and neck marked with small white spots; legs blueish. Length sixteen inches. This kind feeds on fruits.

CAERULEUS. Tail rounded; body blue. *Cuculus caeruleus*, Linn. *Tait fou*, Buff. *Coucou bleu de Madagascar*, Pl. Enl. Blue cuckow. Lath.

Size of the common cuckow; legs and feet black. Inhabits the island of Madagascar.

SINENSIS. Tail long, cuneated; body blue, beneath white; tail-feathers with a white spot at the tips. *Cuculus sinensis*, Linn. *Sanhia de la Chine*, Buff. Chinese cuckow. Lath.

Length thirteen inches; bill, irides, legs, and claws red; crown white, dotted with blue, the rest of the head and chin blackish, and a round patch on the cheeks of white.

AFER. Brassy-green; beneath shining grey; head and neck cinereous; crown brassy-black; tail even, golden-green, beneath black. *Cuculus afer*, Gmel. *Le vouroudriou*, Buff. *Le grand coucou de Madagascar*, Pl. Enl. African cuckow. Lath.

The bill of this bird is straight, blackish, and two inches long; legs reddish; claws black. The total length of the bird fifteen inches. This species inhabits Madagascar.

CUPREUS. Golden-copper; belly and thighs yellow. Cupreous cuckow. Lev. Mus.

Native place uncertain, supposed to be Africa. Its size that of a lark. Tail cuneated, with one or two of the exterior lateral feathers marked with a triangular white spot at the tip; bill and legs black.

INDICATOR. Rusty-grey, beneath white; eyelids naked and black; shoulders marked with a yellow spot; tail cuneated and rusty. *Cuculus indicator*, Gmel. *Le coucou indicateur*, Buff. *Maroc*, *Lobos Abyssin*. Honey guide, Phil. Transl. Honey cuckow, Lath.

The length of this bird is seven inches. The bill is brown at the base, and surrounded with bristles; feathers of the thighs white, with a longitudinal black streak; quill-feathers above brown, beneath grey-brown; the first tail-feathers are very narrow and rusty, the next footy, the inner edge whitish.

The manners of this bird, according to Dr. Sparrman, who particularly describes it, are very singular. The bird feeds principally on honey; and by its note, when in quest of this favourite food, points out to the natives the hiding-places in the trees where the wild bees deposit their stores. The morning and evening are the times of its feeding; and it has a shrill note, which the Hottentot and Dutch hunters carefully attend to, and answer from time to time, till the bird appears in sight, on which they follow it, till it alights on the trees in which the honey is concealed. The hunters never fail to reward their guide with a portion of the booty. Dr. Sparrman assures us, that he has several times been present at the taking of the nests of the wild bees in this manner; but could only obtain two specimens of the birds, both which were females: the inhabitants highly valuing the bird for its useful habits, and conceiving it criminal to destroy it. A nest was shewn Dr. Sparrman, with an assurance of its belonging to this bird: it was composed of slender filaments of bark, interwoven into the form of a bottle; the neck and opening being downwards, and a string, in an arched manner, was suspended across the opening, and fastened to the two ends, supposed to be contrived for the bird to perch upon.

PERSA. Tail equal; head crested; body blueish-green; quill-feathers blood-red. *Cuculus persa*, Linn. *Le touraco de Guinée*, Buff. Crown bird from Mexico. Albin. *Touraco*, Edwards. Mexican cuckow.

Inhabits various parts of Africa, and feeds on vegetables.

REGIUS. Black, with a blue gloss; quill-feathers crimson; bill red, with a yellow front; back of the head purple. Royal cuckow.

Found in the interior parts of Africa.

BRASILENSIS. Tail nearly equal; head crested; body red; quill-feathers yellowish. Linn. *Le couroucoucou*, Buff. Red crested cuckow. Lath.

Inhabits Brasil. Length ten inches; bill pale red; crest red, variegated with black; belly mixed with yellowish; quill-feathers and tail yellow, with a shade of black.

CRISTATUS. Tail rounded; head crested; body shining greenish-ash. Gmel, &c. Madagaicar crested cuckow. Lath.

The length of this bird is fourteen inches. Its bill and legs black; irides orange; breast claret; belly whitish, glossed with rufous; wings and tail beneath cinereous; exterior tail-feathers tipped with white. Inhabits Madagascar.

ÆGYPTIUS. Brown, beneath tawny-white; head, neck, and cuneated tail green; wings rufous. Gmel. Egyptian cuckow.

Length from fourteen to sixteen inches. The bill is black; irides shining red; upper tail-coverts rufous, inclining to green; three last quill-feathers rufous; legs blackish. This kind inhabits Egypt, and feeds on locusts. The bird supposed to be the male is of a shining black colour, with rufous wings.

POLIOCEPHALUS. Tail somewhat cuneated; body above brownish-ash, beneath white, barred with grey; tail-feathers black, with dusky bars. *Cuculus poliocephalus*, Gmel. Grey headed cuckow.

Inhabits India, and very much resembles the last.

SONNERATIÆ.

SONNERATII. Banded with black; above rufous-brown, beneath white; tail-feathers spotted with black. *Cuculus Sonneratii*, Gmel. Sonnerat's cuckoo.

Size of a blackbird. Bill, irides, and legs yellow. Inhabits India.

HEPATICUS. Tail cuneated; body undulated with brown and black; rump ferruginous; bill, tips of the wings, and bands on the tail black, beneath whitish, waved with black; legs yellow. *Cuculus hepaticus*, Gmel. Liver-coloured cuckoo.

Length thirteen inches and a half. Tail-feathers rusty-brown, barred with black, tipped with white, and marked with a small white terminal spot. Native place unknown.

FLAVUS. Testaceous, beneath yellowish; crown and chin pale grey; tail cuneated, black with white lines. *Cuculus flavus*, Gmel. Yellow-bellied cuckoo.

Eight inches in length. The bill and legs yellowish; irides yellow. Inhabits the isle of Panay.

AURATUS. Tail cuneated; body above golden-green, beneath white; five streaks on the head; wing-coverts, secondary quill and tail-feathers at the tip white. *Cuculus auratus*, Gmel. Gilded cuckoo.

Inhabits the Cape of Good Hope. The length of this bird is seven inches. Bill greenish-brown; legs grey.

LUCIDUS. Above green, beneath white; each side a green-gold lunule; quill-feathers and tail brown. *Cuculus lucidus*, Gmel. Shining cuckoo.

A native of New Zealand. Length seven inches. Bill and legs blue; lower tail-coverts white.

COROMANDUS. Tail cuneated; body black, beneath white; collar white. *Cuculus coromandus*, Gmel. Collared cuckoo.

Inhabits Coromandel. Length twelve inches and a half.

CORNUTUS. Tail cuneated; crest bifid; body footy. *Cuculus cornutus*, Linn. Horned cuckoo.

The bill of this bird is greenish-yellow; irides red; crest moveable, and resembling horns; body beneath, with the legs and claws cinereous; tail tipped with white. Inhabits Brazil, and is about twelve inches in length.

DISCOLOR. Reddish-brown; crest biid and orange; two exterior tail-feathers white, the rest white at the tip. *Cuculus discolor*, Gmel. Brown cuckoo.

A native of the East Indies.

PARADISEUS. Two exterior tail-feathers very long and dilated at the tip; head crested; body green. *Cuculus paradiseus*, Gmel. *Le coucou à longs brins*, Buff. Paradise cuckoo.

Inhabits Siam. The length of this bird is eighteen inches. The bill blackish; legs and claws grey.

CUCUMBER, in *Botany*. See **CUCUMIS**.

CUCUMBER, *single-seeded*. See *SICYOS angulata*.

CUCUMBER, *small creeping*. See *MELOTHIA pendula*.

CUCUMBER, *snake*. See *TRICHOSANTHES anguina*.

CUCUMBER, *spiriting*, or *affes*. See *MONORDICA elaterium*.

CUCUMBER, in *Gardening*, is a well known tender plant of the exotic kind, much cultivated in hot-bed frames for the fruit. See **CUCUMIS**.

CUCUMIS, in *Botany*, (derived by Varro from *curvor*, alluding to the crookedness of the fruit. Συκος; Theophr. supposed by some critics to be the קִיפָּה, or gourd of the prophet Jonah.) Linn. gen. 1092. Schreb. 1479. Willd. 1741. Gært. 552. Juss. 395. Vent. 3. 515. Class and order, *monocia syngenesia*, Linn. *Monocia monadelphia*, Willd. Nat. Ord. *Cucurbitaceæ*, Linn. Juss.

Gen. Cha. Males. Cal. perianth one-leaved, bell-shaped, the margin terminated by five awl-shaped teeth. Cor. ad-

nate to the calyx, bell-shaped, five-parted; divisions egg-shaped, veiny-wrinkled. Stam. Filaments in three sets very short, inserted into the calyx, converging; two of them bifid at the tip; anthers five, adnate, linear, serpentine upwards and downwards. *Receptacle* trigonous, truncated, in the centre of the flower. Females separate, but on the same plant. Cal. Perianth as in the male, superior, deciduous. Cor. as in the male. Stam. Filaments acuminate, very small, without anthers. *Pistl.* Germ inferior, large; style cylindrical, very short; stigmas three, thick, gibbous, two-parted, turned outwards. *Peric.* Pome (Berry; Gært; Vent. Smith.) three-celled; partitions membranous, soft, distinct. *Seeds* numerous, ovate-acute, compressed, sharp-edged, generally in a double row.

Ess. Ch. Calyx five-toothed. Corolla five-parted. Filaments in three sets. Stigmas three. *Seeds* sharp-edged, without a border. In this genus are comprehended three of Tournefort's; cucumis, melo, and colocynthis, with part of his anguria.

Sp. 1. *C. colocynthis*. Bitter cucumber, or coloquintida. Linn. Sp. Pl. 1. Mart. 1. Lam. 8. Willd. 1. Woodv. Med. Bot. vol. iii. pl. 175. Blackw. tab. 441. Salb. Hort. 1. tab. 70. (*Colocynthis fructu rotundo major*; Bauh. pin. 313. Tourn. 107. Rai. hist. 642. *C. amara cathartica*; Lob. Ic. 645.) "Leaves multifid; pomes globular, smooth." *Root* annual. *Stems* slender, trailing, angular, scabrous with short hairs, branched. *Leaves* petioled, deeply and obtusely sinuated, green above, whitish and clothed with short hairs underneath. *Flowers* small, yellowish, axillary, solitary. *Fruit* the size of an orange, globular, yellowish when ripe, with a thin coriaceous rind, containing a white spongy intensely bitter pulp. A native of the Levant. The dried pulp separated from the rind is imported into this part of Europe from Aleppo, and is the coloquintida of the shops, the *κόκκυβις* of the Greeks, and the alhandal of the Arabs. For its medical qualities, see **COLOCYNTHIS**. 2. *C. prophetarum*. Linn. Sp. Pl. 2. Mart. 2. Lam. 9. Willd. 2. Jacq. hort. tab. 9. Blackw. tab. 589. (*Colocynthis pumila*; Shaw. afr. 164.) "Leaves heart-shaped, five-lobed, finely toothed, obtuse; pomes globular, spinous-muricated." *Root* annual. *Stems* a foot and half long, trailing, slender, striated, rough with short distant hairs. *Leaves* petioled, greenish, rough underneath, cloven half way down into three lobes, the two lateral lobes more or less deeply two-lobed. *Fruit* variegated with alternate greenish and yellowish streaks, vyeing in bitterness with coloquintida. A native of Arabia. 3. *C. Africanus*. Linn. jun. Supp. 423. Mart. 4. Lam. 10. Willd. 3. Herm. Par. 133. tab. 134. Rai. hist. 3. 334. "Leaves palmate-sinuated, acute; stem angular; pomes oval, echinate." *Stems* numerous, slender, trailing. *Leaves* petioled, quinquefid. *Flowers* yellow, small; males on filiform, somewhat villous peduncles. A native of the Cape of Good Hope. 4. *C. anguria*. Linn. Sp. Pl. 3. Mart. 3. Lam. 11. (*Anguria americana, fructu echinato eduli*; Tourn. 107. *C. anguria folio*; Sloan. Jam. 103. Pluk. tab. 170. fig. 3. *C. subhirsutus minor*; Brown. Jam. 353.) "Leaves palmate-sinuated; pomes globular, echinate." *Root* annual. *Stems* four or five feet long, angular, hispid. *Leaves* petioled, deeply sinuated, rough. *Flowers* yellow, axillary, small as those of bryony. *Fruit* whitish. A native of the West Indies, where the green fruit is eaten, but is far inferior to our common cucumber. It is also frequently used, with other herbs, in soups, and is esteemed an agreeable wholesome ingredient. 5. *C. acutangulus*. Linn. Sp. Pl. 4. Mart. 5. Lam. 7. Willd. 5. Jacq. hort. 3. tab. 73, 74. (*C. longus indicus*; Grew Mus.

Muf. 229. tab. 17. fig. 2. Petola; Rumph. Amb. 5. 458. tab. 149. Picinna; Rheed. Mal. 8. 13. tab. 7.) "Leaves round-angular; pomes with ten acute angles." *B.* "Fruit shorter, somewhat top-shaped." *C. indicus striatus*; Pluk. Alm. 123. tab. 172. fig. 1. *Root* annual. *Stem* climbing, slender, pentagonal, almost smooth. *Leaves* petioled, heart-shaped, sharply angular, ferrate-toothed, green above, pale underneath, rough with very short hairs. *Flowers* yellowish, rather large; males in a terminal raceme, bracteate; females solitary, axillary. *Fruit* six or eight inches long, lessened towards the peduncle, terminated by a pointed deciduous operculum, smooth, becoming dry and woody when ripe. A native of the East Indies, China, and Tartary. Its fruit, when half ripe and tender, is eaten either boiled or pickled, but is rather insipid. Loureiro observes, that the operculum attributed to the fruit is not noticed by Rumphius, nor was it found in the plants examined by himself in Cochinchina and China. 6. *C. conomon.* Mart. 12. Lam. 6. Willd. 6. Thunb. Flor. jap. 324. (Kwa; Kämpf. Amœn. 811.) "Leaves angular, somewhat lobed, toothed; pomes spindle-shaped, ten-furrowed, smooth." *Root* annual. *Stem* decumbent, striated, rough with scattered hairs. *Leaves* petioled, heart-shaped, nerved, green above, pale underneath, rough with hairs on both sides, especially on the nerves underneath; petioles about three inches long, hairy. *Flowers* yellow, axillary, clustered, on short lipid peduncles. *Fruit* the size of a man's head. A native of Japan, where it is cultivated in great abundance. Its flesh is firm, and is a common food with the Japanese. 7. *C. melo.* Common or musk melon. Linn. Sp. Pl. 5. Mart. 6. Lam. 1. Willd. 8. (*Melo vulgaris*; Bauh. pin. 310; Tourn. 104. Rai. hist. 644. Blackw. tab. 329.) "Angles of the leaves rounded; pomes generally either torulose or reticulated." *Root* annual. *Stems* trailing to a great length, much branched, furnished with tendrils, scabrous. *Leaves* alternate, petioled, slightly toothed, rough with short bristly hairs. *Flowers* yellow, rather small, axillary, solitary, on short peduncles; calyx covered with white hairs; corolla wrinkled, ribbed, with bristles on the ribs on the outside; germ nearly globular, covered with white hairs. The pistiferous flowers have been observed in England to have large, apparently fertile anthers, and to be therefore really hermaphrodite, but as they are accompanied by flowers which have stamens only, the pollen in their anthers is probably defective. This peculiarity has not been noticed by the French botanists. *Fruit*, as in most plants which have been long in a state of general cultivation, very various in its size, form, and other qualities; commonly roundish or oval, sometimes a little flattened at both ends; in some varieties the size of a man's head; in others, of a moderate size; and in others, much smaller; the external surface of some even; of others, warty; of others, more or less netted; and of others, marked with rounded, protuberant longitudinal ribs; the colour either grey, yellowish, or green; rind thickish and rather hard; flesh white, green, yellow or reddish, abundant, tender, succulent, of an agreeable taste, and pleasant smell, sometimes a little resembling that of musk; the inner pulp watery, appearing to consist of broken fibres sweet-tasted. *Seeds* numerous, commonly in a double row, flattish oval, covered with a tough skin similar to parchment, which contains a sweet oleaginous, saponaceous kernel. The melon is generally esteemed one of the most delicious summer fruits, and when taken in moderate quantity is of easy digestion; but if taken to excess is apt to produce violent and sometimes dangerous disorders in the stomach and bowels. It is pe-

cularly refreshing in hot climates, where it is of a superior quality, abounds more in saccharine matter, and is said rarely to disagree. In Europe it is commonly eaten with sugar, and if pepper or ginger be added, it is less likely to produce any unpleasant consequences. In France it is eaten as a sauce to boiled beef, and, as Mr. Pinkerton asserts, is then perfectly harmless. The flesh is also preserved for the same purpose in vinegar and sugar, which, seasoned with cinnamon and cloves, makes a pleasant wholesome composition and will keep several years. The wild plant from which these luxurious varieties have been derived is unknown, but is said by Linnæus to be a native of Tartary. For a more particular account of the principal varieties, and of the manner in which they are cultivated, see the article CUCUMIS, in *Gardening*. 8. *C. muricatus.* Willd. 7. "Leaves heart-shaped, angular; angles rounded, hoary underneath; pomes cylindrical, muricated." *Leaves* similar to those of the preceding, pubescent; younger ones tomentous on both sides. *Male flowers* axillary, clustered, very short, peduncled; females solitary. A native of Tranquebar, Klein. 9. *C. dudaim.* Linn. Sp. 6. Mart. 7. Lam. 5. Willd. 9. (*C. orientalis*; Walth. Hort. 133. tab. 21. *Melo variegatus*; Dill. Elth. 223. tab. 77. fig. 218. *Melo pusillus*; Pluk. Alm. 143.) "Angles of the leaves rounded; pomes cylindrical, with the navel retuse." *Root* annual. *Lower leaves* roundish, upper somewhat angular; both slightly villous and toothed, green above, paler underneath. *Flowers* yellow, divided into five or six roundish segments, slightly crenate. *Fruit* the size and form of an orange; rind smooth, sometimes sparingly warty, slightly furrowed only at the top, variegated with green and dark orange streaks, and with oblong unequal green spots, yellow when fully ripe, and at length whitish; with a whitish musky smell, and a whitish insipid pulp. A native of the Levant. 10. *C. Chate.* Linn. Sp. Pl. 7. Mart. 8. Lam. 4. Willd. 10. (*C. ægyptius rotundifolius*; Bauh. pin. 310. Tourn. 104. Chate; Alp. Ægypt. 114. tab. 116. Vcl. Ægypt. 47.) "Hirsute; angles of the leaves rounded, toothed; pomes spindle-shaped, attenuated at both ends, rough with hairs." *Root* annual. Whole plant villous, almost tomentous, whitish green, with the habit of the common melon, but decidedly distinguished by the form of the fruit. *Stems* procumbent, villous, obtusely pentagonal, zig-zag, branched. *Leaves* petioled. *Flowers* yellow, small, axillary. A native of Egypt, where it is much cultivated for the sake of the fruit, which is esteemed wholesome, and eaten both raw and cooked, but when raised in our climate, is very indifferent. A pleasant refreshing beverage is also obtained from it in the following manner. When the fruit is quite ripe, but not separated from the stem, a hole is made in its upper end, into which a stick is introduced, for the purpose of bruising the pulp; the hole is then closed up with wax, and the fruit, still fixed to the stem, is placed in a hole underneath, and covered with earth. At the end of a few days the pulp becomes entirely dissolved, and with the addition of a little sugar, is fit for use. 11. *C. pubescens.* Willd. 11. "Leaves heart-shaped, somewhat angular, rather acute, sharply toothed, scabrous; pomes elliptical, obtuse, pubescent." *Root* annual. *Fruit* three inches long, near one inch thick, obtuse at both ends; green when young, and marked with rather obscure narrow longitudinal streaks; afterwards entirely white. 12. *C. maculatus.* Willd. 12. "Leaves heart-shaped, obtusely angular, roundish-obtuse, finely toothed, scabrous; pomes elliptical, narrowed at the base, smooth." *Root* annual. *Fruit* somewhat similar to that of the preceding, but smooth, and narrowed at the base, marked when young with broad green streaks; white when ripe,

C U C U M I S.

ripe, and variegated with green spots. Native country unknown. 13. *C. sativus*. Common cucumber. Linn. Sp. Pl. 8. Mart. 9. Lam. 2. Willd. 13. Gært. tab. 88. fig. 3. Sabb. Hort. 1. tab. 63. Black. tab. 4. Lam. Ill. 795. Bauh. pin. 310. "Angles of the leaves right; pomes ovate-oblong, scabrous." *Root* annual. *Stems* creeping, hispid, rough. *Leaves* larger, longer and thicker than those of the melon, less rounded, with sharper and more projecting terminating angles. *Flowers* yellow, axillary; germ oblong, obscurely angular, not hairy, but mucicated with prickles springing from a smooth warty substance. *Fruit* elongated, almost cylindrical, obtuse at both ends, scabrous, with warts, yellowish, white or green in different varieties; rind thin, coriaceous; flesh spongy; primary cells three or four, each divided into two secondary ones, and these again into the proper cells of the seeds, filled with a pulvulent jelly. Supposed to be a native of Tartary, cultivated in almost every part of the civilized world. For its most remarkable varieties and the mode of its cultivation, see the article CUCUMIS, in *Gardening*. 14. *C. anguinus*. Linn. Sp. Pl. 10. Mart. 10. Willd. 14. (Petola anguina; Rumph. Amb. 5. 407. tab. 148.) "Leaves lobed; pomes cylindrical, very long, even-surfaced, twisted." *Root* annual. *Flowers* smaller than others of the genus, with a long tube. *Fruit* three feet long, or more, red when ripe, with a rank smell, and bitter taste. A native of the East Indies. According to La Marek it is only a variety of *trichosanthes anguina*. 15. *C. flexuosus*. Linn. Sp. Pl. 9. Mart. 11. Lam. 3. Willd. 15. Bauh. pin. 310. Tourn. 104. (*C. oblongus*; Dod. Pempt. 662. *C. anguinus flexuosus*; Lob. Ic. 639.) "Leaves angular, somewhat lobed; pomes cylindrical, furrowed, curved." *Root* annual. *Stems* slender, creeping, villous. *Leaves* petioled. *Flowers* small, yellow, axillary. *Fruit* the size of a large pear, thicker at the upper end, smooth, even-surfaced, of a delicious flavour. A native of the East Indies; cultivated in Japan, where it is called by the Dutch basket melon.

CUCUMIS aegyptiacus, luffa arabum. Vell. Morif. See MOMORDICA *luffa*.

CUCUMIS agrestis; Blackw. See MOMORDICA *claterium*.

CUCUMIS bryonoides bijnagarica; Pluk. } See SICYOS *an-*
CUCUMIS candensis monospermus; Herm. } *gulata*.

CUCUMIS maderaspatana; Linn. See BRYONIA *maderaspatana*.

CUCUMIS minima fructu ovali; Sloan. } See MELOTH-
CUCUMIS parva repens virginiana; Pluk. } *RIA pendula*.

CUCUMIS sylvestris; Cam.

CUCUMIS sylvestris aspinus dictus; C. } See MOMORDICA
Bauh. } *claterium*.

CUCUMIS triphyllus; Plum. See ANGURIA *trifoliata*.

CUCUMIS, in *Gardening*, comprehends plants of the tender trailing annual kind, of which the species mostly cultivated are the common cucumber, (*C. sativus*) and the common or musk melon, (*C. melo*).

In the first of these species the roots are constituted of many long slender white fibres, the stems being likewise long, rather slender, and very branchy at their extremities, either trailing on the surface of the ground, or climbing by means of clasps; the leaves are large and angular, on long erect footstalks, with much bristly roughness. The flowers have the segments of the calyx much longer, and the corolla of a deeper yellow colour, than in the melon. They are male and female on the same plant, in the same or different fruits, the latter being succeeded by oblong rough fruit.

In the second species the roots are composed of a great number of very stout wide spreading fibres, the stems being

procumbent or trailing to a considerable length, very much branched, and furnished with tendrils for climbing; the leaves are palmate-5-nate, or entire, slightly toothed, having rounded corners and rough with bristles; the flowers are pale yellow in colour, lateral and solitary, those which are termed female having four large anthers, with the germ sub-globular, and covered with white hairs.

It has been suggested by Martyn, that the discovery of what are usually termed female flowers, being *real* hermaphrodites with fertile anthers, renders it less necessary to convey the males to them, as practised by some, than is commonly supposed.

The fruit is of a roundish or oval form, blunt, usually furrowed longitudinally, occasionally netted, and warted, or carbuncled, being from four to twelve inches in length and diameter, of a yellowish green, or white colour, and having a firm pulp, musky, reddish, seldom green. It is said to have been first introduced into Europe from Persia.

Of the first of these species, or the cucumber, the principal varieties are, the *common rough green prickly*, which is six or seven inches long, with a dark-green skin, closely set with small prickles, and which is hardy, a plentiful bearer, but does not fruit early. The *short green prickly*, which is three or four inches long, with a rather smooth skin, but having small black prickles; it is one of the hardiest and earliest sorts. The *long green prickly*, which is from six to eight or nine inches long, thinly set with prickles, and a good bearer; there is a sub-variety also with white fruit. The *early green cluster*, which is shortish, early, with the flowers in clusters. The *long smooth green Turkey*, with large stalks and leaves, and the fruit generally from ten to fifteen inches long, with a smooth rind without prickles. The *long smooth white Turkey*, which is less watery, and of a better quality. The *large smooth green Roman*, with long large fruit, quite smooth. The *long white prickly Dutch*, with fruit eight or ten inches long, white, with small black prickles, which is a bad bearer, less hardy, but the fruit not so watery, and with fewer seeds.

And of the second sort or melon, there are also numerous varieties, but those most deserving of cultivation are, the *Cantaleupe*, so called from a place near Rome, where it has been long cultivated. Its flesh, when in perfection, is delicious, and may be eaten with safety. The outer coat is very rough, and full of knobs and protuberances like warts; it is of a middling size, rather round than long, and the flesh, for the most part, of an orange colour. There are several sub-varieties, such as the *large black carbuncled*, or *black-rock*, which is of a blackish green-colour; the *large green carbuncled*; the *large white carbuncled*, and the *orange*. The *Romana*, which is forwarder in the season than the above. The *suocado*, which is also a good sort when cultivated for early fruit, but inferior to the cantaleupe. The *zatte* is likewise a good sort, but very small, seldom bigger than a large orange; it is a little flattened at the two ends, and the outer coat is warted like the small cantaleupe. The *small Portugal*, sometimes termed the *dornier melon*, is a pretty good fruit, the plants generally producing them in plenty. It may be cultivated for an early crop. And the *black Galloway*, introduced from Portugal by lord Galloway, is likewise a good sort for early cultivation, as the fruit ripens in a very short time from its first setting. There are likewise some other varieties which may be cultivated.

Method of Culture.—In the raising and producing of these different fruits, much care and attention are necessary, as well as a considerable degree of skill in the regulation, management, and application of the heat which is required to bring them to maturity in the best and most perfect manner.

Mode of Culture in the Cucumber kind.—The common method of raising these plants is by sowing the seeds annually in hot-beds covered by frames and glasses, for the early production of fruit, and in the open ground for the late crops. The former mode must, however, in general, be that which is practised in some degree or other, till the season becomes perfectly warm and settled, as towards the latter end of May or beginning of June. Various are the methods of applying heat in the producing of this fruit, at early and late periods, which have been employed and recommended; but those which seem to have had the greatest success are *dung hot-beds, bark hot-beds, steam-pans, and flued pits*. It is sufficiently obvious that, in whatever manner artificial heat is made use of in this intention, the great point to be attended to is, that of communicating and continuing it in as regular and equal a way as possible. But there is another circumstance which equally deserves consideration in the business; which is, that of its being accompanied with a suitable degree of moisture. It is conceived to be principally on this account that stable-dung answers more completely in the raising of this sort of fruit than tanner's bark, or the use of flued pits, which have been more lately had recourse to for the purpose. The author of the Forcing Gardener has remarked that the deficiency of this gentle moist heat is the reason why bark hot beds are less useful for raising the early crops, but highly serviceable in the late ones, as they have the effect of "drying off the external damps which are then prevalent," and of course hasten the maturity of the fruit. In other cases the plants "are impatient in a dry fire heat."

The most material, and, indeed, chief objections to the employing of the steam of boiling water in the forcing of cucumbers, are the great difficulty of keeping the heat up in a regular manner, and the vast trouble that attends the use of it.

The great and principal inconveniences that have been met with in the forcing of this fruit on dung hot-beds, are the danger of injuring the plants by too much heat, and that of their being blanched by the rank steam that mostly abounds. In order, therefore, to obviate these inconveniences, it has been attempted to raise these fruits on the beds of the preceding year by means of linings of fresh dung; but in practice it has not only been found that such beds are equally liable to damps; but at the same time exposed to much risk and inconvenience from the frequent loss of heat in the linings, which are made use of for the purpose.

On these different accounts it is therefore conceived probable that, until some more convenient mode of applying and keeping up a regular moist heat be discovered, than has hitherto been made use of, the practice of procuring this sort of fruit on fresh made dung hot-beds, must be had recourse to as the best and most certain method for the early crops in all cases.

In the raising and cultivating of the cucumber in this way, the apparatus and materials which are principally necessary in carrying it to any considerable extent, are a sufficient number of frames or pits of different sizes, with glass lights for covering them, so as to prevent the entrance of water and air. And it is usual, where this culture is much attended to, and practised in the most perfect manner, to have a one-light frame for the seed-bed; a two-light one for pricking out the young plants, and nursing them in; and two or more two-light frames for their fruiting in: but they may be cultivated very well, on a small scale, with one or two small frames, or proper pits. See *Forcing FRAME* and *FRAME*.

In order to the constructing of the hot-beds, the prin-

cipal material is that of fresh horse-dung in neither too long or too short a condition, but such as is proper for taking on the process of fermentation. It should be had in the proportion of about one cart-load to each light, and be prepared for the purpose by being well shaken together into a heap, ten days or a fortnight before it is made use of; as by this means a regular heat will be brought on, and the rank heat and steam, as well as the disagreeable smell, be removed. Some gardeners, in order to promote these intentions, and render the preparation more perfect, have the whole turned over once or twice. Care, however, should be taken, that the reduction of the dung be not carried too far before it is put on the bed: as, where that is the case, too little heat will afterwards be produced, and there will be want of regularity in its being supplied.

In cases where this sort of material is scarce, and there is bark at hand, beds for the purpose may be made with it, having only dung for the outides; but care must be taken, that they be so covered as that the roots of the plants never reach the bark, as it cankers and destroys them in a very short time, by which much loss and disappointment must be sustained.

In respect to the manner of making beds for this sort of culture, some gardeners, where proper forcing grounds are not provided, with a view of neatness, sink the foundations of them; but this should never be practised, except where the soil is very dry and gravelly, as the stagnation of moisture is very prejudicial in the bottoms of such beds. If the soil be of a moist retentive nature, it will indeed be highly beneficial to have the bottoms raised to some height above the surface of the natural ground. Besides, where they are not sunk, the heat from the linings is more beneficially applied, and, at the same time, with greater facility and convenience.

In all cases where proper forcing grounds are not made use of for the culture of these plants, open, dry warm, sheltered situations, which decline to or have southern aspects, should be chosen for the purpose.

The earthy material, or mould for covering the beds with, should be of a light, good, rich quality, prepared by being thrown into a heap for several months before it is employed. The author of the Scotch Forcing Gardener advises three-fourths of the richest black loam that can be procured from a pasture, and one-fourth of vegetable mould from decayed tree-leaves, mixed and incorporated well with a due proportion of good stable-dung, as the best for this purpose. The rotten dung of old hot-beds is, however, most commonly employed with such earthy substances as those just mentioned.

But the mould made use of for the more early crops should be laid up in some open place, where it may be kept in a rather dry condition, to render it more fit for the purpose, when it may be wanted.

And when it is to be made use of, it should not be rendered fine by sifting; as when made too fine, it is apt to be too close and compact, and by that means not only to prevent the roots of the plants from perfectly establishing themselves, but confine the heat too much, and endanger the plants in that way in a considerable degree.

In addition to these, some small pots will be wanted, where this sort of culture is attempted at an early period, both for the purpose of sowing the seed in, and that of pricking the young plants out into, that they may be removed and transplanted with greater ease, certainty, and convenience, and with less danger of being injured in their growth. It is usual for each pot to contain two or three plants, which are generally sufficient for a one-light frame.

Pots

Pots of the sizes denominated thirty-twos and forty-eights are commonly made use of in this intention.

In addition to these requisites, bafs mats are necessary to cover the glasses in the nights with, and when the weather is cold and bad. Straw, and other similar substances, may be employed for the same use; but they are much less convenient than mats. The periods of sowing and beginning the works of forcing, in order to have this sort of fruit in the early season, must vary according as it is wanted; but for the very early crops, as those to be cut in the end of December, and the following month, and in February, March, and April, it should, for the former, be done towards the end of October and beginning of the following month; and for the latter, in December, January, and the beginning of February. But for later crops, such as those to come in in June and the following month, it should be in April and May; and still later crops are often produced on ridges, in the open ground, without artificial heat being employed.

The common and general practice is, however, chiefly to have only three crops: the first in March or April, on hot-beds under glasses; the second in May and June, under hand-glasses; and the last on ridges, as just mentioned.

But in order to have the crops come in regularly, an exact attention should be paid to the periods of putting in the seed, and beginning the work of forcing; as without this there must be great uncertainty.

In respect to the choice of seed for the different crops, the early short and long prickly sorts are mostly made use of for the first or early crops; but the latter for the general ones, and those of the other larger kinds for the later crops. The seed should be taken from the earliest fruit, and at the first or second joints, and be perfectly well ripened. And, in order to prevent its running too luxuriantly into vine, it should be kept two years or more before it is made use of; or, when employed while fresh, be kept some weeks or months in a dry, warm situation, as by this means the plants fruit better, from their growth being in some measure restricted.

Method of forming the Beds and raising the Plants.—In the early and more forward culture of this vegetable, it is mostly the practice, where there are sufficient conveniences, and plenty of dung or other materials, to have recourse, as has been suggested above, to two or more hot-beds under frames; as a small one for sowing the seeds upon, and a large one for growing the plants upon; or, sometimes the second is made of a more moderate size, and used for nursing the plants in, previous to their being set or ridged out in the large one, for the purpose of producing fruit. However, by making the beds of a good size, and in a substantial manner, with due attention to linings, they may be grown very well on one or two hot-beds. When cultivated on a small scale, seldom more than one is indeed employed in the raising of this sort of fruit.

In regard to forming the beds, attention must be paid to the size of the frames, and to making them considerably larger than the boxes. Some gardeners advise only a few inches; but Mr. Nicol thinks they should extend beyond the frames, at least eighteen inches all round the frame.

In the business of building the beds, the dung, prepared as mentioned above, should be used in the following manner, beginning with the most littersy part, and afterwards using that which is more reduced. The different parts should be well shaken and mixed together, and beaten down with the fork, or trodden equally in, where very littersy, once or twice as the work proceeds, till they are made up to the full height of five feet in the back, and four in the front

of the frame. Some gardeners suppose two feet and a half, or three feet, to be sufficient, when the beds are merely intended for just raising the plants; but the former practice is probably always the best, where plenty of materials can be easily procured. When thus prepared, it is the custom of some to let them remain with the frames and glasses upon them for a few days, that the rank heat may be brought up; and when it begins to go off, to cover them over with mould, prepared in the manner already described, to the depth of five or six inches, sowing the seed in little drills half an inch deep, when the mould is a little warmed. Others cover them almost immediately with dry earth, tan, or other similar material, to the depth of five or six inches, sowing the seeds in small pots filled with mould, plunging them previously for a little time in the beds; cautiously guarding against too much heat at first, by drawing up the pots when necessary.

The author of the Scotch Forcing Gardener, however, directs that when the beds have been made to the height mentioned above, they should be tarfed over in a careful manner, as in forcing asparagus, and the frames then placed upon them; laying dry fine sea or pit-sand in a sloping direction, according to the frames, over the whole, to within six inches of the lights, and above that two inches in thickness of light sandy loam. The seeds should then be sown in small garden pots or pans, filled with entire vegetable mould from decayed tree-leaves, and covered to the depth of half an inch; plunging them to the brims in the centres of the beds endways, and a foot from the backs. The glasses should then be placed over them in the common manner; when, in the course of twenty-four hours, the beds will in general take on heat, when a little air should be constantly admitted, by lifting the backs of the lights an inch or more in height, and the fronts about half that height, except when there is frost, in order to discharge any rank heat or vapour that may be produced in such circumstances.

It is necessary that the frames should be carefully matted up every night, when the sun begins to decline, and be uncovered before eight o'clock in the morning, when the season will permit: as perfect a regard should be had to this as those of air and water. And Mr. Nicol says, that "a little kindly steam in the morning is a good symptom, but it ought never to be encouraged to any great extent." He never wishes to see more steam in the beds at this time of the day, than what is entirely dispelled in the first hour after the frames are uncovered and exposed.

It is proper that the bottoms of the pots or pans should be occasionally continued to be examined, to see that the heat is not too violent; raising and watering them, with water brought to a proper temperature, in the beds when necessary. And as soon as the plants have attained about two inches growth, they should be pricked out into other small pots, filled with the same sort of mould, three or four in each, putting them as far distant in each as possible, the mould being settled to their roots by a little water; replunging them in the beds to their brims, the surfaces of which being previously wrought over to the full depth of the sandy covering, and another stratum of sandy loam applied as before. They should be carefully nursed in these situations, by due attention to the admission of air, the giving of water, and the regulation of steam; continuing occasionally the examination of the bottoms of the pots, to guard against too much heat being applied to the roots of the plants.

And while the plants are thus carefully brought forward to the proper state for being set or ridged out in the fruiting hot-beds, which is the case when they have acquired a vi-

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gorous growth, and put forth three or four rough leaves, some stable dung, in proportion to the extent of the frames, should be got ready in the manner directed above for forming the fruiting beds, which should be made up in the same way as the former. The frames and lights should then be placed over the beds, in order to bring up the heat, and protect them from being injured by wet: and when the heat has become moderate, which will require time in proportion to the extent of the framing, the beds should be earthed or moulded over, the surfaces of them being previously rendered even. In performing this business, the earth should be applied in such a manner as to form a sort of hillock in the middle of each light, within about a foot or eighteen inches from the backs of the frames; the whole of the other parts being covered equally to the depth of two, three, or more inches. The author of the Scotch Forcing Gardener, however, directs, that when the dung is suspected of heating to too great a degree, the beds should be turfed all over, as mentioned above: but where this is not the case, a large round turf placed in the middle of each light, exactly under the parts where the plants are to be placed, may be sufficient; the surface of the dung, in this case, being previously covered over to the depth of six inches with light sand, or well rotted old tan, which should be first made perfectly dry. The turf is, however, rejected by many as wholly unnecessary.

But whichever practice is made use of, the beds will in general be in a proper state for putting the plants in in about twenty-four hours; but before this is done, the mould or earth should be drawn up, so as to raise the hillocks to within five or six inches of the glasses, exactly over the turfs, where they are used, leaving them ten inches or a foot in breadth at the tops or upper parts.

In the operation of planting or ridging out the plants, a hole should be formed in each hillack, sufficiently large for the complete reception of the plants, with the entire balls of earth about their roots, up to the level of the surfaces of the hills, covering them over with a little mould; the whole being then settled with a little water, previously brought to the proper state of warmth, and the glasses put on. It is the practice with some, in order to promote the adhesion of the mould about the roots of the plants, to have recourse to watering the pots before they are turned out of them.

When the plants have been thus set out, they should be carefully attended to in respect to air, water, covering in the nights and bad weather, the state of heat of the beds, linings, the occasionally moulding of the spaces between the hills, and the stopping and training of the plants; in all which much care is requisite.

In regard to regulating the fire, the state of the season and the beds should be fully considered; and air admitted accordingly, by raising the back part of the lights. The waterings should be cautiously given in the winter and early spring, but more freely as the warmth of the weather advances; shutting down the frames for some time after each application. In the more early crops, much less water will be requisite than in those in which the season is more advanced; and the former will stand in need of much less frequent waterings over heat than those of the latter. In these latter, shade is likewise occasionally necessary, when the weather is sunny. The glasses should be carefully covered up with mats every evening, before the influence of the sun is wholly gone, and when the weather is very severe, more than one mat may often be found necessary. The mats should constantly be removed the first thing in the morning, or as soon as the sun rises upon the frames, when the state of the weather will admit; but in very severe

weather, not removed at all, or but a very little in the middle of the day.

And the heat of the beds is likewise to be particularly regarded at first, by a frequent examination of the tryng-sticks; and regulated in such a manner as to promote the healthy growth of the plants. When it continues too great, it should be let off, by making holes in the sides of the beds, and the use of fresh earth on the surfaces.

But when the heat of the beds begins evidently to decline, recourse must immediately be had to the application of linings of fresh dung round them, so as to keep up a due degree of heat; care being constantly taken to repeat them as frequently as may be necessary, and, at the same time to guard against the prejudicial effects of too great heat.

And these linings Mr. Nicol advises to be covered by turf or mould, and to have the sides and ends of the beds cut off, and formed with them.

But the business of earthing the beds between the hillocks should be gradually performed, as soon as the heat is become perfectly moderate; the mould for the purpose being previously laid in some part of the frame. Mr. Nicol considers fifteen inches as a good medium for the earth above the sand or tan, and thinks the business should be done either a few days before or after the application of the linings.

And the business of pruning or stopping is by some begun while the plants are in the nursery-beds; but others defer it till after the plants are ridged out in the fruiting-beds.

The author just noticed does not think it at all material to pick out the heart-buds, as soon as the plants have formed their rough leaves; as, from the most accurate trials, and the most minute observation, he is convinced "it is of no manner of consequence whether the buds are picked out or not." He "feldom thinks of picking or pinching, till the plants begin to put forth runners or vines; nor even then, unless they happen to put forth too few to furnish their sides of the frames, till he preserves the rudiments of the fruit."

But it is then, he supposes, time to stop those vines which have fruit *shewn*; but the others may be suffered to run to the length of six or eight joints, and be then stopped, to cause them to put out fertile ones, which they seldom fail to do, when the plants are in a healthy state of growth.

In cases in which an extraordinary quantity of male blossoms appears, it is recommended that part of them be rubbed off in a gentle manner with the finger and thumb; as the knife should never be made use of, unless in cutting out old vines. But this should never be attempted where there is not a very full blow, as it is proper to assist nature without either spurring or thwarting her. And when the female blossoms are in a state of sufficient forwardness, they may be carefully impregnated with the strongest and most healthy of the males, by which the swelling of the fruit may be greatly promoted; for though the fruit may be formed, yet to a tolerable size, and be fit for the table without, it will not ripen its seed. And though the *farina* of the male blossoms may often be deposited on the renals by means of the wind and insects, it is the safest mode, in the early culture of these plants, to have it performed by the hand, as handsome set fruit may be set apart for seed with more certainty. In the execution of this work, which some suppose the most properly performed the day or day after the flowers of both sorts are fully open, the best way is to gather the male blossom with a short stem, removing the petal or *corolla* carefully from about the *stamina* and *anthera*, and then take the stalk of the blossom betwixt the finger and thumb, and

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apply the top of the stamina to the centre of the three stigmas of the female blossoms, and, by giving it a slight twirl, discharge a portion of the farina into the stigmata of the female; making use of a fresh male blossom for each impregnation.

As soon as this has been performed, the plants begin to grow vigorously, and produce large quantities of fruit. Great care should therefore be taken to keep the vines in due order, and not too thick or crossing one another; all the withered and decayed leaves being removed, as well as the others; when too numerous or too irregularly placed.

And air should now be admitted more freely; increasing the proportion daily, as the season advances. More large and repeated waterings should likewise be given from the rose of the pot; and the advantage of warm showers may be taken, as the weather becomes more warm. Few plants require more of this fluid than these, at this period of their growth. When the season becomes fine in May, the glasses may be wholly removed during the day-time. About the middle of the following month, a lining, when necessary, may be applied to the fronts of the frames, in the same way as advised for the other parts; which will continue a due degree of heat, as long as it will be requisite to attend to the state of the bottom heat in the beds.

It may be observed, that in the early culture of the cucumber, it is a good practice never to depend for raising the plants upon the first sowing; but to continue sowing occasionally, both in the nursery and fruiting hot-beds, in pots, managing the plants in the same way as those in the seed-bed; as by this means plants of different growths will be constantly at hand, for the supplying of accidents, as well as for succession crops or other purposes.

Method of Culture under hand or other Glasses.—In this method of cultivating the cucumber, the seed should be sown towards the latter end of March, or beginning of the following month, on an old hot-bed; having the plants in a proper state for being set or ridged out about the beginning of May, which is in general sufficiently early for their succeeding well in this mode of culture. The most proper sort of seed for this purpose is that of the *long prickly green* cucumber.

The beds for this purpose should be prepared of hot dung, somewhat in the manner directed for the early crops; being made from two to three feet in thickness, and about three in width, along the ground in a straight line, having the distance of from three to four feet from each other. The most usual method is to form them in long trenches, or in holes of a foot and half in depth; but they may be made on the level surface, where this mode is attempted at an early period. In either method the beds should be directly earthed over, raising the mould into little hillocks for the reception of the plants, the hand-glasses being immediately placed over them; and in the course of a day or two, the earth will be in a suitable condition for receiving the plants. These should be put in, in the middle of the hills, three or four in each, with balls of earth about their roots, in the same manner as practised in the other crops; a little water being given at the time, and the glasses put on, proper shade being had recourse to when necessary, from the great heat of the sun.

Besides, air and water should be afforded in due proportion, according to the state of the weather and the heat of the beds; keeping the glasses covered well with mats in the nights, and when the season is severe.

As soon as the heat in these beds begins to decline, more earth should be applied between the hills of plants, and some fresh dung externally, by way of linings, to preserve and

keep up the due degree of heat as much as possible, when the weather continues cold. And as the warmth of the season advances, air and water should be given more freely, as there may be occasion.

As soon as the glasses have become pretty full with the plants, they should be raised a little, that the runners may extend themselves without, and be properly trained and pegged down; continuing to attend them carefully in respect to covering in the nights, and admitting air and water, the last being frequently applied all over the beds in these cases.

By this mode of culture, cucumbers may be provided from about the latter end of May till the beginning of September, and sometimes a little longer.

Method of Culture on Ridges in the open Ground.—In this method of raising cucumbers, a warm sheltered situation, which is open to the south, and where the soil is dry, good, and rich, should be fixed upon; the land being well dug into a trench, and a suitable proportion of rotten dung covered in; the surface being formed into a foot or more of bank, sloping towards the south. Some gardeners, however, divide the ground, after being neatly dug over, into beds five or six feet in width, with ridges of a foot or a foot and a half between them, which is also a neat and good method.

In either method of management, the seed should be put in as soon as the beds are ready; in the former, towards the back parts, and in the latter, along the middle, to the depth of about half an inch, six or seven seeds in a place, an inch or two apart; light sprinklings of water being occasionally given afterwards, till the plants begin to appear.

The most suitable and proper season for performing these sowings is about the end of May, or first part of June, according to the state of the weather, and other circumstances.

The principal management and culture which is necessary, during the growth of these crops, is that of keeping the vines perfectly free from all sorts of weeds, thinning the plants out to proper distances, directing the runners in a regular manner along the surface, and keeping them properly watered, according to the state of the season, and other circumstances.

These kinds of crops chiefly come in about the middle of August, and are principally employed as picklers; for which purpose the beds should be carefully looked over two or three times every week, on dry days, and all fresh collared as are in a proper state, as about one or two inches in length, and the thickness of the finger.

Whenever the weather proves wet, they should be guarded as much as possible from the moisture, as under such circumstances they are very apt to become spotted, and to have a bad appearance.

In the business of saving cucumber seed, some of the best and most early cucumbers of the general frame crops should be reserved till perfectly ripened; when they must be separated from the vine, and be laid in a proper place to dry; the seeds being then separated from the pulp, and rendered more perfectly dry, when they may be put up for use, for which they are, as has been seen, in the most proper condition, after they have been kept two or three years, and are in a perfectly dry condition.

The chief and most prejudicial insect that infests crops of this sort is the aphid, which is shewn to be present by the curling up of the leaves, and is readily destroyed by fumigating with tobacco, or in the manner which has been advised for the peach. See *AMYGDALUS*.

Method of Culture in the Melon kind.—In the business of raising

raising this sort of fruit, the same kind of contrivances and apparatus is necessary as in the culture of the cucumber; but it is better if the frames or pits have rather more depth, and are somewhat larger in their other dimensions. But in the view of having melons ripe at an early period, as in May or the following month, brick pits without any cross flues through them, have been found in practice highly useful by Mr. M'Phail. The pit in each frame being about three feet six inches in width, ten feet in length, and three feet deep below the surface of the flues. In the construction of these pits, it is considered the best and cheapest method to carry up brick walls four inches in thickness, to a proportionate height above the flues, securing them at the top with a proper light frame of wood for the lights to rest upon.

Some advise that the beds (for the early crops especially) should be prepared in the same manner, and with materials of the same kind as for the cucumber; but that the later ones may be produced in hot-beds formed of tanners' bark, either wholly or in great part.

In the brick pits, the author of the "Gardener's Remembrancer" makes use of well fermented dung in first filling of them, being so worked as that the noxious particles may have passed off by evaporation. Upon the surface of this well prepared dung, about a foot in depth of good rich earth is deposited. That which is of a loamy pliable quality is considered the best. Such as is procured from the surface of a common which has been long subject to the pasturage of sheep, after being laid in a heap until it becomes rotten, and then well broken down and pulverized, is likewise well suited for this purpose. But mould from a good quarter of the kitchen garden will answer.

When these sorts of pits are employed, it is suggested that the dung in the pits may continue several years, and that it is not necessary for the earthy material which is intended for the plants to grow in, to be renewed every season, as it will be sufficient to add each year, by incorporating it with the surface mould, about a foot in depth of some rich good earth, with a proper quantity of well rotted dung or vegetable mould.

For the ripening of this fruit at a late period, as in July and the two following months, the same practical writer has recourse to beds made of dung, from two to three feet in height; that which has been previously employed for melons in early forcing, being made use of, as being best suited to the purpose in consequence of its not being liable to heat violently, and from its noxious vapours having been discharged.

It is likewise stated, that the leaves of trees, where they can be provided in sufficient quantity, are very proper for forming beds of this sort, provided dung is provided for making linings round them.

Where pits are made use of for early forcing, the flues which surround the bed of earth in each frame are kept clear of earth to admit the heat to pass freely from them to warm the air in the frames, till the weather becomes suitably fine; and with dung beds a similar space is left unfilled up next the insides of the box frames, close to the linings, for the same purpose, being closed with earth when the season becomes fine.

Mr. M'Phail further states, that such beds of dung, or of the leaves of trees as are formed in the winter season for forcing asparagus or lettuce, and in the spring for bringing forward at a more early period, than by the natural climate, plants of the cauliflower and lettuce kinds from seeds will be suitable for planting melons upon, at the latter end of May or beginning of the following month; as by these,

and the assistance of linings of hot dung, heat enough is produced at this season, to bring melons of the best quality to a state of maturity. It is further suggested, that of whatever sorts of materials the beds for this purpose be formed, the air which is afforded by them should be perfectly sweet, which in practice is readily known by the smell, but which is sometimes difficult to produce, as when the materials of which the beds are formed are too moist, they become sour by stagnation, and till that be removed, which often requires time, the plants will not have a proper growth; but besides this, such foul air has the tendency of producing various prejudicial insects.

The same writer conceives, that in covering beds of these kinds, eight or ten inches in depth of earth or mould, are quite sufficient for the roots of the plants to run in, as their roots do not naturally run deep, but spread out horizontally near the surface, especially by the forcing heat of the beds.

But Mr. Nicol thinks that these beds in the early culture should be turfed all over in a rather stronger manner than in those of the cucumber, and be covered with a compost consisting of one half of strong brown loam, a quarter light black loam, an eighth vegetable mould, and the same quantity of stable dung.

The most proper season for sowing the seed for the very early crops, is about the middle of January; but the beginning of February is probably a better period: and sowings should be made twice in March for successive crops. These different sowings should be made on hot-beds, or in pots of light mould plunged in hot-beds prepared for the purpose, as in the cucumber; or the pots may be placed in such old hot-beds of that sort as are at work, the same care and management being employed in the raising and nursing of the plants as in those of the cucumber kind. Mr. M'Phail, however, either sows them in the bed of earth where they are to remain and fruit without being transplanted, or in pots in a hot-bed to be afterwards transplanted, when the rudiment of the first rough leaf begins to appear, into smaller sized pots to the number of two or three plants in each; being, when they have made two or three rough leaves planted out, where they are to produce fruit, about a foot from the glass, and the earth well pressed round the ball.

As soon as the plants have attained five or six weeks growth, or have two or three rough leaves, and are beginning to send forth runners, they are in general in a proper state for being planted or ridged out in the fruiting-beds, which should be prepared in the above manner, or as in those for cucumber plants: and after being well moulded over, the pots of plants put in with the full balls of earth about their roots exactly in the same way as was practised for cucumbers, immediately placing the glasses over them. Where the beds are sweet, Mr. M'Phail advises that the lights should be kept shut down nearly close from the time they are planted out till they have made good roots which is shewn by the shoots, in order to raise as great a heat as a warm lining and the sun could afford, carefully covering in the nights when necessary, as is sometimes the case in May and June.

After this, the plants should have air admitted pretty freely, and be kept in a moderate state of moisture till they begin to show fruit, great care being taken that the heat is not too great, and to keep the beds as free from steam as possible; but from that period until the fruit is fully set, and has begun to swell, the waterings should be very sparing, especially when the season is moist and rainy.

As the heat in the beds begins to decline, it should be refreshed by the application of linings, in the same manner

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as practised for cucumbers; and the spaces between the hills of plants must be gradually filled up with mould nearly the same height.

And as the runners proceed in their growth, they should be trained in a regular manner; and when they have three joints length they must be stopped. Some, however, stop them before, when they first begin to put forth runners. By these stoppings, the vines are induced to throw out lateral runners which afford fruit. Mr. Nicol directs, that the vines that have fruit on them should be shortened at the second joint above it, and that such as have none should be trained regularly to the length of seven or eight joints, and then stopped, to induce them to put forth new vines, which mostly show fruit at the second or third joint. It is of much importance in this state of the plants to keep up a due degree of heat, as they not only set the fruit much better and more plentifully where it is the case, but continue their growth in a more perfect manner. The young fruit mostly shows itself with numerous male blossoms; these should not be picked off as is sometimes the practice, as their farina is necessary for fecundating the female flowers, which in the early crops may be performed in the manner directed for the cucumber. While the fruit is setting, air should always be pretty freely admitted when the weather is suitable.

And when the fruit is perfectly set, water should be given in larger proportions till it has done swelling and begins to become ripe, when it should be very sparingly employed; as where given in too great abundance, the flower of the fruit is not only much impaired, but it is often burst, and rendered less valuable by such means.

It is also necessary, that in proportion as the melons increase in size, pieces of slate or tile should be placed under each of them, as it not only prevents them being injured by the damp, but prevents their acquiring an earthy flavour. It is the practice with some to cover the whole surface with tiles, or some straw or other similar substance, but this is not by any means judicious, as the first causes too much heat by the reflexion that is produced, and the latter not only confines the moisture, but has a tendency to generate and harbour noxious insects of different kinds.

With regard to the management of the vines, as the fruit approaches to the state of maturity, they should not be suffered to retain too many leaves, nor these permitted to shade it from the influence of the sun. It is necessary to look over and examine them frequently, but never to prune them too greatly at one time, as where that is done the plants are apt to sustain much injury by bleeding too much. Fresh air should be continued to be admitted freely whenever the state of the weather will allow of its being done with propriety.

This is a sort of fruit which generally becomes ripe in the course of six or seven weeks from the time of its setting, and should be cut as soon as ever it has obtained that state, as when delayed much of the fineness of flavour is lost. The signs of maturity are a sort of cracking at the base about the stem, having a fine yellow colour, and affording a fine fragrant smell with a degree of softness about the top. It should be cut with a portion of the stem, and laid in a dry airy situation till wanted for use or sale.

It has been observed by the author of the "Scotch Forcing Gardener," that many of the early sown kinds are capable of "producing a second crop, equal both in quantity and quality to the first." With this intention he advises, that after the first crop has been cut, the vines be "shortened back to the last live joint on each; the beds being well watered, and protected from the effects of the mid-day sun for eight or ten days, at which time the plants will

begin to push forth afresh, and show fruit in plenty." We believe, however, that this practice is but seldom found to answer well.

Method of Culture under Hand or other Glasses. It is occasionally the practice with gardeners to raise melon crops on ridges under hand, or other sorts of glasses, especially when the season is fine and sufficiently warm.

The ridges in these cases must be formed with good prepared stable dung, in the same manner as practised in forming those for cucumbers; and also moulded or earthed into small hillocks in the same way, only rather more earth should be employed in the case of the melon. The plants may be raised in the seed or other beds, and be carefully nursed in a similar method, till they are in a proper state of growth to be set out, which in this sort of culture should not be done till towards the middle or latter end of May, according to the state of the season, and the nature of the climate.

The plants should be turned out of the pots, and set or ridged out, one on each hillock, in the same way as those of the cucumber kind; shade and a slight watering being given at the time, and the glasses immediately put over them.

And after being thus planted out, the same care and management are necessary as in the other crops, in respect to air, water, covering in the nights, and bad weather, training and stopping the plants, as well as in moulding up the spaces between the hills, and the application of linings when required. As soon as the vines begin to fill the glasses, they should be trained on the outside of them, the glasses being raised upon blocks, but still left upon the plants protecting the vine on the outside as much as possible from wet, when the season is bad and rainy.

And the same directions are applicable after the setting of the fruit, until it becomes in a state proper for cutting, as in the frame crops or those in pits.

Method of Culture in flued Pits.—This is a method which, as has been already remarked, is principally made use of for raising late crops of this sort of fruit, but is capable of being made use of in the early crops likewise. It is practised and recommended both by Mr. Nicol and Mr. M'Phail.

The plants for this purpose may be raised in hot-beds, or under hand or other glasses, until they are of a suitable growth to be planted in the pits, which is as described above.

It is sufficiently early, in general, to commence this sort of culture about the middle or latter end of June, as at this period but little bottom heat will be wanted; and the old beds that have produced other crops may be converted to this use. The Scotch Forcing Gardener directs that one-third new be mixed with the old tan or dung in order to renew the heat, levelling the whole to the bottom of the flues quite round. Turning is considered by him as unnecessary, but mould should be applied to the thickness of about fifteen inches, so as to raise the whole surface to the height of the tops of the flues.

And when the beds are thus prepared, the plants should be put in, in a line along the middle of them in the pits, at the distance of about two feet from each other, care being taken to keep their roots as much as possible from reaching the tan or bark. See *BARK-pit*.

In this way in their after-management, the plants require the same care according to the season, both in regard to air, water, training, stopping, and impregnating, as has been directed for the crops in the frames and other methods.

But towards the latter end of August or beginning of the following

following month, when the heat of the beds in the pits begins to be deficient, and there is much moisture and cold, it will mostly be requisite to have recourse to the aid of fire heat, in order to fully maturate such fruit as is not already thoroughly ripened. The fires should, however, at first be slow, and only made in the evenings; but afterwards increased, as the severity of the season demands, so as that it may raise the heat of the air in the pits to about 70 degrees of Fahrenheit's thermometer, in the evenings and mornings, about eight o'clock. Mr. Nicol, indeed, directs, that in order to admit air sufficiently, and keep up a proper degree of heat in dull hozy weather, a little fire should be made in the morning; and that as the growth of the plants is now over, water should be made use of with much caution, being wholly discontinued as soon as the fruit has attained its full growth and perfection.

In respect to the seed employed in the culture of this sort of fruit, it should be such as is taken from the best plants of the most curious varieties, and which has been perfectly ripened, and preserved for one or more years in some dry place, as new seed seldom answers well in the cultivation of this sort of fruit.

There are many insects which do great damage to these plants. The *acarus*, or *red spider*, is one that frequently does much injury to the melon, when the season is dry and there is a dry heat in the beds. Its attacks are shewn long before it becomes visible, according to Mr. Forsyth, by the "leaves curling and cracking in the middle."

And as a remedy in this situation, he advises, when the weather is warm and sunny, the watering them all over the leaves from a watering-pot with the rose upon it, or an engine, about six o'clock in the morning, and about eight to shade them with mats, when the sun shines, shutting the frames down close till towards eleven, then to admit air in a small proportion, continuing the mats till about three in the afternoon, and then removing them. In this way the leaves are prevented from injury by the sun while wet. And when there is a south or south-west wind, the waterings may be repeated about three in the afternoon, shutting up the frames to produce a strong exhalation, and destroy the insects. In the operation, as much water as possible should be thrown on the underside of the leaves, gently turning the vines for the purpose. The lights and sides of the boxes should likewise be well watered; and before the frames are made use of again they should be well washed inside and out, first with water, and then soap-suds and urine in a state of mixture. Where melons have been infested with the spider the preceding season, none of the earth or mould should be made use of again, as it may do much injury.

In the business of sprinkling the leaves, water that has been several days exposed to the sun, or made soft by wood-ashes, should be employed if possible.

But the author of the *Scott's Forcing Gardener* observes, that water at some periods cannot be thus applied without much injury to the plants, and that the leaves and vines are so brittle and tender, that they cannot be brushed or touched without harm being done. It is of course obvious, that much care and circumspection is necessary in extirpating these insects by the use of water. Mr. M'Phail, after suggesting that the plants should "be duly attended to in giving them plenty of heat and water," adds that, "late in the spring, and in the summer months, they should be occasionally watered all over their leaves, till the earth in which the roots of the plants grow, be perfectly soaked, and then the frames shut down with a great heat in them." This he considers as only imitating and assisting nature, as in his

method, by means of pits, there is nothing to obstruct the superabundant water, as it oozes through the beds freely. He further suggests that "in hot dry weather the plants should be sprinkled frequently with clean water about four o'clock, and the lights shut down immediately for the night."

CUCUMIS capparis, in the *Botanical Writings* of the Arabians, a name given by Avicenna, and others, to the plant which produced the fruit called bel. This fruit was like the capers in shape, and had a hard shell over its kernel, like that of a hazel-nut. Such is the description they give of it, and of the fel and sel, two other fruits as like it in shape, and other respects, as in virtue.

CUCUPHA, an ancient form of *Medicine*; being a cap, or cover for the head, with cephalic powders quitted in it; worn in many nervous distempers, and particularly such as more immediately affect the head: as against catarrhs, defluxions, &c. It is now much out of use.

CUCURBIT, *CUCURBITA*, in *Chemistry*, an earthen, or glass vessel, called also body; of the figure of a gourd, or a pear; wherein are put the matters to be distilled.

It is sometimes also made of tin, and sometimes of brass, tinned. When a distillation is to be made, they fit on to it a glass head with an aperture, and a neck proportional. Thus fitted, it is called an *alembic*; which see.

CUCURBITA, in *Botany*, (so called, according to Scalliger, from the curvature of the fruit.) Linn. gen. 1051. Schreb. 1478. Willd. 1740. Gært. 554. Juss. 326. Vent. 3. 516. Class and order, *monocia syngenesia*; Linn. *Monocia monadelphia*; Willd. Nat. Ord. *Cucurbitaceae*, Linn. Juss.

Gen. Ch. Male flowers. *Cal.* Perianth one-leaved, bell-shaped, the margin terminated by five awl-shaped teeth. *Cor.* monopetalous, adnate to the calyx, somewhat bell-shaped, five-parted; segments veiny-wrinkled. *Nectary* a small concave triangular gland in the centre of the flower. *Stam.* Filaments united, in three sets, adnate to the calyx; anthers five, serpentine upwards and downwards, linear. Females. *Cal.* Perianth as in the male, superior, deciduous. *Cor.* as in the male. *Nectariferous gland* concave, spreading. *Stam.* Filaments barren, very short, united into a slender ring at the base. *Pist.* Germ large, inferior; style conical, short, trifid (quinquefid; Gært.) stigmas dilated, turned outwards in a zig-zag manner. *Peric.* Pome (Berry; Gært. Vent. Smith) generally three-celled; partitions membranous, soft, distinct. *Seeds* numerous, compressed, with a tumid border, obtuse, placed in a double row.

Ess. Ch. Calyx five-toothed. Corolla five-parted. Filaments in three sets. Pistil three-cleft. Seeds with a tumid border.

This genus includes four of Tournefort, cucurbita, pepo, meopepo, and anguria.

Sp. 1. *C. lagenaria*. Bottle gourd, or calabash. Linn. Sp. Pl. 1. Mart. 1. Willd. 1. "Leaves heart-shaped, somewhat angular, tomentous, with two glands underneath at the base; pomes woody." A native of moist ground in America. 2. *C. idololatrica*. Willd. 2. "Leaves heart-shaped, cuspidate, generally obsolete three-lobed, pubescent, with two glands at the base; pomes pear-shaped." A native of Guinea. 3. *C. ficocaria*. Willd. 2. Molina Chil. ed. germ. 316. "Leaves angular, somewhat lobed, tomentous; pomes woody, globular." A native of Chili. 4. *C. aurantia*. Willd. 4. "Leaves somewhat heart-shaped, generally three-lobed, cuspidate; sharply and finely toothed, scabrous; pomes globular, even-surfaced." 5. *C. ovifera*. Linn. Mant. 126. Mart. 3. Willd. 5. "Leaves lobed;

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lobed; pomes inversely egg-shaped; tendrils with seven digitated divisions." Linn. "Leaves heart-shaped, angular, five-lobed, finely toothed, pubescent; pomes inversely egg-shaped, marked longitudinally with linear stripes." A native of the country about Atrachan. 6. *C. umbellata*. Willd. 6. "Leaves heart-shaped, angular, five-lobed, finely toothed, scabrous; male flowers umbelled; pomes tomentous." A native of the East Indies. 7. *C. hispida*. Mart. 2. Willd. 7. Thunb. Fl. Jap. 322. "Leaves angular; stem and petioles hispid." A native of the East Indies and Japan. 8. *C. pepo*. Pumpkin or pumpkin. Linn. Sp. Pl. 2. Mart. 4. Willd. 8. "Leaves lobed; pomes even-surfaced." Linn. "Leaves heart-shaped, obtuse, somewhat five-lobed, finely toothed; pomes roundish or oblong, even-surfaced." Willd. A native of the East Indies, Cochinchina, and China. 9. *C. verrucosa*. Linn. Sp. Pl. 3. Mart. 5. Willd. 9. "Leaves lobed; pomes knobby-warted." Linn. "Leaves heart-shaped, deeply five-lobed, middle lobe narrowed at the base, finely toothed; pomes roundish-elliptical, warted." Willd. 10. *C. subversuosa*. Willd. 10. "Leaves heart-shaped, deeply five-lobed, middle lobe narrowed at the base, finely toothed; pomes club-shaped-elliptical, somewhat warted." 11. *C. melopepo*. Squash. Linn. Sp. Pl. 4. Mart. 6. Willd. 11. "Leaves heart-shaped, obtuse, generally five-lobed, finely toothed; pomes with depressed knobs tumid at the edge." 12. *C. citrullus*. Water melon. Linn. Sp. Pl. 5. Mart. 7. Willd. 12. "Leaves many-parted." Linn. "Leaves five-lobed; lobes sinuate-pinnatifid obtuse; pomes elliptical, even-surfaced." Willd. A native of the South of Italy and Sicily. 13. *C. mammosa*. Willd. 13. Molina Chil. 316. "Leaves many-parted; pomes spheroidal, with papilike elevations." A native of Chin.

This genus is very nearly allied to cucumis, being distinguished from it chiefly by the tumid border of the seeds. Its species, like those of cucumis, are annual with herbaceous stems, furnished with tendrils, and, according to circumstances, either procumbent or climbing. Like all other plants which have been long cultivated in different climates; it has branched out into innumerable varieties, which are the glory of the horticulturist; but generally prove a provoking stumbling block in the way of the systematic botanist, and often baffle his most laborious researches.

Duchefne, a French naturalist, in a course of several years, made numerous experiments on the plants of this genus with a view to determine which are really distinct species and which are merely varieties. The result of his labours was a conviction that there are three original races which do not naturally propagate with each other, and from no two of which a cross breed can be artificially produced. La Marek has adopted his general ideas, and has published them, with a few alterations, in the Encyclopédie Methodique. He is of opinion that there are four original species. As this arrangement has not appeared in our language, we shall lay it before our readers, though much abridged, to bring it within our proper limits, and shall retain the French names when corresponding English ones do not occur.

I. The calabash, or white-flowered gourd. *Cucurbita leucantha*; Duchefne. *C. lagenaria*; Linn. "Corollas widely spreading, somewhat declated; seeds truncate-emarginate at the tip." Lam. Leaves almost round, pale green, soft, woolly, slightly viscid and odorous, with two small conical glands underneath near the insertion of the petiole. Flowers white, almost wheel-shaped. Fruit, at first, pale green; when fully ripe, dull yellow, varying greatly in form and size; flesh spongy, very white. Seed with a border

not entirely surrounding it, but forming a kind of appendicles at its sides, giving it a square, not an oval form. The varieties of this original species may be reduced to three principal families. 1. The *cougourde*, or *proper bottle gourd*. *C. lagenaria*; J. Bauh. 2. 216. Tourn. 107. *C. lagenaria*; flore albo, folio molli; Bauh. Pin. 313. Morif. Hist. 2. 23. § 1. tab. 5. fig. 1. *C. prior*; Dod. Pempt. 648. This variety is distinguished by the form of the fruit, having, next the peduncle, a long tail, like the neck of a bottle, which, in one sub-variety, is swollen near the bottom, and joined, by a contraction, to the upper part of the fruit. 2. The *proper gourd*.¹ *C. latior*, folio molli, flore albo; J. Bauh. 2. 215. *C. major fessilis*, flore albo; Bauh. Pin. 312. *C. latior*; Dod. Pempt. 669. Morif. § 1. tab. 5. fig. 2. Fruit large, tumid, with a hard shell. The young negroes fix one of the dried fruits under each of their arms, to assist them in supporting themselves, when they are learning to swim. It is from a resemblance in the form of the fruit, and the purposes to which it is applied, that the West Indians have called the crescentia of Linnæus the calabash-tree. (See CRESCENTIA.) Hence also the cucurbits of the chemists are said to have received their name. 3. The *trumpet*, or *long gourd*. *C. longa*, folio molli, flore albo; J. Bauh. 2. 214. Rai. Hist. 638. Morif. Hist. 2. 24. § 1. tab. 5. fig. 3. Rumph. Amb. 5. 297. tab. 144. *C. longior*; Dod. Pempt. 669 and 707. *C. americana teres & b. cubalis*; Tourn. 107. The great length which the fruit of this variety sometimes acquires, depends, in a considerable degree, on its position. When it lies on the ground, it is often curved in the shape of a crescent, and sometimes becomes tumid at both ends, like a pill. It differs also much in size. The thickest have the tenderest rind, and the most fleshy pulp. They are eaten in America, and in the South of Europe. The last two varieties differ chiefly in size, and are united by several intermediate ones. They are considered by Sauvages as properly one, distinguished from the first by having toothed, not entire leaves.

The first variety is said by Hasselquist to grow in all parts of Egypt, and in Arabia, wherever the mountains are covered with a rich soil. The poor people eat it boiled with vinegar; or fill the shell with rice and meat, making it into a kind of pudding. The rind of all three, especially of the first, is hard, and almost woody, when dry, and is made into drinking cups, bottles, and other domestic utensils, for the use of the lower ranks of people. This species appears to be a native of Asia, Africa, and America; and it is only since the discovery of the latter, that many of its numerous varieties have been obtained.

II. The *potirón*, or *large-fruited gourd*. *C. maxima*; Duchefne. *Melopepo fructu maximo albo*; Tourn. 106. *C. aspera*, folio non albo, fructu maximo albo fessili; J. Bauh. 2. 221. *Pepo maximus indicus compressus*; Lob. Ic. 641. *Pepo compressus major*; Bauh. Pin. 311. Rai. Hist. 642. *Cucurbita pepo*; Linn.? "Flowers bell-shaped, broadish internally at the base; border reflex and; fruit round, compressed." Lam. Duchefne doubts whether this be really an original species. Sauvages, the first botanist who called it *potirón*, pronounces it distinct from the next, and characterises its fruit in concise but lively terms, as a sphere with compressed poles, and narrowed meridians, well delineated in Tournfort's figure, tab. 34. La Marek agrees with him, and observes, that it differs from the following in the form of the flowers, in its roundish heart-shaped leaves, on nearly horizontal petioles, and in the greater strength and size of all its parts. The fruit, in particular, is sometimes not less than thirty pounds in weight; with

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with a fine rind, and a firm but juicy melting flesh. La Marek observes, that its enormous size is probably the effect of cultivation. It was not known before the sixteenth century, and no account of its origin has been preserved, a circumstance which seems to us to strengthen the doubt, with respect to its being an original species. There are three principal varieties: the common yellow, with a fine yellow flesh, which is the largest; the large green, with an orange-red flesh; and the small green, which is much esteemed on account of its continuing in a state fit for eating longer than the other kinds.

III. The pepo, or pumpkin gourd. *C. pepo*; Duchef. *C. ovifera*, *C. pepo* β. *C. verrucosa*, and *C. melo-pepo*; Linn. "Flowers bell-shaped, narrowed within at the base; border erect." This species, like the preceding, has bell-shaped yellow-flowers; but its corolla is narrowed at the base, so as to be almost funnel shaped, and its border is always erect. Both have whitish elliptical, not truncated or emarginate seeds. The present may be divided into two principal families. 1. The *melon gourd*, or *musk gourd*. This family is rather of an ambiguous nature, and has been little noticed by botanists. The oval form of its seeds, the size, shape, and colour of its flowers, the angular figure of its leaves, and the disposition of its branches, pronounce it a gourd; but its soft woolly leaves, its pale-coloured and nearly wheel-shaped flowers, the long green points of its calyx, and the milky taste of its fruit, indicate its alliance to the calabashes. In the French West India islands it is called *citrouille melonnée*, and is cultivated in the south of France and Italy, under the name of *citrouille musquée*. Like the next family, it has numerous varieties, distinguished by the shape and colour of the fruit, as it is either flattened at the ends, spherical, oval, cylindrical, or pistil-shaped, is greater or less in size, and more or less ribbed; is of a deeper or paler green on the outside, and has its flowers varying from a very pale yellow to a deep orange. 2. The *polymorphous gourd*. The common character of this family depends on the size and regularly conical shape of its flowers, the oblique, or almost erect, never-horizontal direction of its leaves, and their brown colour and roughness, resulting partly from the dryness and brittleness of their surface, though their nerves and veins are very succulent; and partly from their hairs, which are stiff and tumid at the base. In all other respects it is variable, without end. It may, however, be divided into five subordinate families; α. the false oranges and false colquints. *C. polymorpha colocyntha*; Duchef. *Pepo rotundus aurantii forma*; Bauh. Pin. 311. *C. minima lutea amara*; J. Bauh. 2. 231. *Cucurbitula pilâ palmarâ non multo major rotunda*; J. Bauh. 2. 218. *Pepo fructu minimo spherico*; Tourn. 105. *C. magnitudine aurantii*; J. Bauh. 2. 226, &c. *Colocynthis pomiformis cortice maculato*; Bauh. Pin. 314. This family, of which the false oranges may be considered as the principal, and the false colquints as a variety, is, from the following characters, supposed by Duchesne and La Marek to approach nearest to the primitive state of the gourd. *Leaves* about the length of the petiole, moderately cut. *Male and female flowers* equally distributed over the whole plant, making it very fertile. *Fruit* spherical, with a diameter only double that of the flower, regularly three-celled; rind forming a rather solid shell, at first dark green, at length of a lively orange; flesh yellowish, fibrous, bitterish, soon becoming dry, and then acquiring somewhat of a musky flavour. *Seeds* very numerous, rather large. β. The coucourdettes, false pears, or milky colquints. *C. polymorpha pyridaris*; Duchef. *Colocynthis pyriformis, five pepo amarus*; Bauh. Pin. 313, and *C. oblonga*; Bauh. Pin. 313. Tourn. 108.

C. five colocynthis amara pyriformis variegata et oblonga viridis et parva alba; J. Bauh. 2. 230. 229. *C. ovifera*; Linn. Mant. 126. This division is very constant in its principal characters; and though it has many varieties, they diverge from each other very little, so that it almost seems to claim the rank of an original species. Its leaves are rather more cut, and it is altogether commonly more slender than the preceding. Its flowers are the smallest in the whole genus; its seeds are small, and very much elongated; its fruit also is small, often pear-shaped, or at least egg-shaped; the rind generally brownish-green, marked with milk-white bands and spots; the flesh very white, at first moist, afterwards fibrous and friable. γ. The barbarine. *C. verrucosa*; Bauh. Pin. J. Bauh. Linn. *Melo-pepo verrucosus*; Tourn. *C. Turbinatæ majores albæ, & variegati coloris*; J. B. The fruit of this division is distinguished by the remarkable warts or tumours on its surface; it is sometimes about the size of an orange, but in most of its varieties larger; its shell hard and woody, generally entirely yellow or spotted, but sometimes marked with green bands. δ. The giramous and citronilles. *Oblong-fruted cucurbita. Pepo oblonga*; Bauh. pin. 311. Tourn. 105. *C. folius asperis five Zuccha*; J. Bauh. 2. 218. *C. pepo* β. Linn. *Pepo vulgaris*, Rai. hist. 639. *Pepo virginianus*; Bauh. pin. 311. *Macocks virginiani*; Rai. hist. 641. This division takes its chief character from its oblong fruit. The giramous are distinguished from the citronilles by their flesh, which is commonly paler, and always of a finer texture; and by their leaves, which are generally more deeply cut, those of the latter being often only angular; but their most striking difference is in the size and colour of the fruit; which in the former is often very large, and generally of a dark green colour; in the latter small, pale green, yellow, or even white. There are, however, intermediate varieties which bring them together. One of these has long been known in the south of Europe by the name of Malta or Barbary cucumbers. ε. The Patisson, or squash, *melo-pepo clypeiformis*; Bauh. pin. 312. Tourn. 106. Lob. ic. 643. *C. melo-pepo*; Linn. *C. clypeiformis five siciliana*; J. Bauh. 2. 224. Also *C. clypeatæ & affines omnes*, J. Bauh. &c. The plants of this division affect a kind of contraction in all their parts, an hereditary malady, which has been continued more or less strongly marked through several ages, and may always be reproduced at pleasure by sowing the seeds of the most deformed plants. The stems and branches are peculiarly stiff and strong, in consequence of their knots being placed near together; hence instead of extending themselves easily along the surface of the ground, they rise abruptly on one side or the other, sometimes almost perpendicularly, and do not touch the earth till they are weighed down by the increasing heaviness of their fruit. The small flowers have, in consequence, peduncles more than double the usual length, without which they would not find room to expand; the petioles also are similarly lengthened, and not being able to support the leaves, are several times curved, as if they were about to become twining. The stems, it is observed by Linnæus, are furnished with tendrils, though they are neither climbing nor procumbent; but Loureiro asserts that in China and Cochinchina they always climb, whenever they meet with any proper support. The fruit has a fine rind, like that of the false colquints, but generally softer with finer, white, and rather dry flesh. It is generally four or five-celled, and varies much in its form, being sometimes round, sometimes pear-shaped, and frequently appearing as if it was squeezed in by the nerves of the calyx; its flesh swells into various protuberances, which sometimes form ten longitudinal ribs, and sometimes surround either its apex

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or its base; sometimes it is contracted in the middle, and suddenly expands into a large head, like that of a young mushroom: sometimes it is entirely flattened like a buckler, and either regularly or more frequently irregularly plaited. The seeds are short and roundish, with an uneven surface. This variety is common to both hemispheres, and is much cultivated in the warmer climates, as a wholesome esculent. The fruit is commonly gathered in America when half grown, and eaten boiled as a sauce to meat. It is of great use in long voyages, as it may be kept for several months fresh and sweet.

IV. The pasteque and water melon. *C. anguria*; Duches. *C. cucullus*; Linn. *Anguria cucullus dicta*; Bauh. pin. 312. Tourn. 106. *Citrullus folio colocynthidis fec- to*; J. Bauh. 2. 235. *Anguria indica*; Rumph. amb. 5. 400. tab. 146. fig. 1. *Citrullus officinarum*; Lob. ic. 640. Jacq. five *anguria*, Pl. Bras. 263. "Corollas somewhat wheel-shaped; seeds coloured; leaves lacinated." Lam. The deeply divided leaves of this species are stated by Lin- næus and other botanists to be its peculiar character. This, however, is not perfectly correct; some of the varieties of the gourd having their leaves almost, if not quite as much lacinated. But those of the water melon may always be distinguished by the firmness and brittleness of their sub- stance, and their much more nearly vertical direction. The corolla is less spreading than that of the calabashes; and smaller, less bell-shaped, more deeply cut, and of a paler yellow than that of the gourds. The fruit is roundish or oblong, with a fine, thin, even rind, remarkable for its spines, stellated like those of the sea urchin, not parallelo- gram, as in the gourds. The seeds are constantly of a deeper colour than the flesh; while in the three other species they are always much paler. Duchesne mentions three principal varieties, α , with firm flesh, β , with reddish flesh, γ , with whitish flesh. The first is particularly distinguished in the north of France by the name of pasteque, and is eaten only as a preserve, or baked with sweet wine, like Burgundy pears. The two latter are the true water melons, so much esteemed in all hot countries for their pleasant, cool, refreshing flesh, which is always of a deep colour, and so succulent that it melts in the mouth; the central pulp is so fluid, that, like the milk of the cocoa nut, it may be sucked or poured out through a hole in the rind, and affords an agreeable be- verage; but this must be done when the fruit is first gathered, otherwise it will soon decay; the fruit is therefore generally brought to the market with the hole plugged up. It is a native of the East Indies, Cochinchina, and China, and is mentioned by Maregrave as growing in Brazil, but may have been brought thither by the Portuguese. On account of its excellent qualities, it is much cultivated in all the warmer countries of the four quarters of the globe, and is said by Hasselquist to serve the Egyptians for meat, drink, and physic, as long as it continues in season, which is from the beginning of May to the end of July, or the beginning of August.

Propagation and Culture—The calabashes and the gourds may be propagated by sowing their seeds on a hot-bed in April. When the plants are sprung up, they should be transplanted into another moderate hot-bed, where they should have a great deal of air, and be treated hardily; as soon as they have got four or five leaves, they may be trans- planted into holes made in an old dunghill, and be allowed a good deal of room to spread. They are sometimes for the sake of ornament fastened to walls, pales, or hedges; and sometimes trained over harbours, which they soon entirely cover, affording a pleasant shade. The orange-shaped gourd is generally preferred for this purpose, on account of its

handsome fruit. None of the kinds are cultivated in this country as esculents. The calabashes are more tender than the gourds, and require a more careful treatment; but if covered with hand-glasses when young, they will flower and fruit in the open air. The water melons may be raised in the same manner, and on the same beds with melons and early cucumbers, only they must have more room, and must be constantly kept in a good heat, with a free admission of air in favourable weather. The best sorts to cultivate in our climate are those with small round fruit, which come from Africhau: for those with large fruit scarcely ever ripen: but in the best state to which they can be brought here, they are not much esteemed, and are very seldom raised.

CUCURBITA sinensis, fructu longo anguino vario, flore can- dido; Till. Sabbat. See *TRICHOSANTHES Anguina*.

CUCURBITA, in *Gardening*, comprises plants of the trail- ing herbaceous annual kind; of which the species prin- cipally cultivated are, the bottle, or long gourd, (*C. lagen- aria*;) the pompon, or pumpkin gourd, (*C. pepo*;) the warted gourd, (*C. verrucosa*;) the squash gourd, (*C. melo- pepo*;) and the water melon, (*C. citrullus*.)

The first species has a thick, trailing, downy stem, branch- ing into numerous spreading runners, extending along the surface of the ground, fifteen or twenty feet in length. The leaves are large, roundish, heart-shaped, and woolly; the flowers large and white, succeeded by whitish-yellow fruit, shaped similar to a bottle, having a large roundish belly, and smooth neck, two or more feet in length, and from nine to eighteen inches or more round, with a ligneous durable shell.

In the second species the stem is thick, angular, extremely hispid, branched, climbing by means of bifid tendrils, or extending to the distance of forty feet. The leaves cor- date, large, roundish-angular toothed, wrinkled and hairy on both sides. The flowers are of a yellow colour; and the fruit roundish, ovate globular, or oblong-ovate, being pale green on the outside, having within a spongy insipid white pulp or flesh. Its season of flowering is from June to August.

The stalks in the third species are trailing, very branchy and spreading, running on the ground as in the last sort; the leaves are large and lobated, and the flowers yellow, be- ing succeeded by fruit of a roundish, knobby, warted ap- pearance, white, and of a middling size.

In the fourth species the stem is roundish, hairy, pro- cumbent, or climbing. The leaves lobed-angular, and the flowers yellow: the fruit large, reddish-yellow, or yellowish- white both within and without, mostly roundish, but often flat at both top and bottom, constantly torulose, but rarely warted. It is common in North America.

The stem in the fifth species is round and striated, long, branched, and hairy; the flowers are yellow; and the fruit large, smooth, round, or oblong, a foot and a half in length, within watery, sweet, very red or pale. It is a native of South America.

There are numerous varieties in all these different species. In the first species the chief of these are, the common long-fruited, the long protuberant-bellied, the long sickle- shaped, the long-taper, and the long-turbinated bottle- gourd.

Of the second sort there are several varieties, as the com- mon large round-fruited yellow, the oval yellow, the oblong yellow, the whitish-fruited, the stone-coloured, the flesh-co- loured, the parti-coloured, the marbled small round, the orange-shaped, the pear-shaped, the turbinated, the hemi- spherical or semi-globular, the egg-shaped, the striped

roundish, the striped egg-shaped, the striped turbinated, and the striped pear-shaped pompon, &c.

Of the third kind the principal varieties are, the roundish-warted, the oblong-warted, the flat-warted, the bottle-shaped-warted, the orange-shaped-warted, the lemon-warted, and the yellow-fruited.

Of the fourth sort the varieties are, the common broad flat, the buckler-shaped, the conical citron-shaped, the flat-sided, the turbinated, the hemispherical, the depressed, the star-shaped, the white-striped, and the yellow-striped squash-gourd.

And of the fifth species the chief varieties are, the large round red fleshed, the large round white fleshed, the large oblong, and the small round water melon.

Method of Culture.—In the manner of raising of most of these plants, as well as in that of their after culture, the aid of artificial heat and shelter is generally requisite, especially when to be forward at an early period.

Method of Culture in the Gourd kind.—This is always effected by sowing the seed annually, either on slight hot-beds, or in the open ground, in the spring months; but the former is probably the best mode, as the plants are more early. In the first method, it should be performed about the latter end of March, or the middle of April; and when the plants have attained a pretty strong growth, and been hardened by the free admission of air, they should be carefully removed into the situations where they are to remain in the open ground with balls of earth about their roots, as unless this be done they do not succeed so perfectly.

In the latter mode of raising the plants, the seed may be sown in the natural ground where the plants are to remain, about the middle of May; open sunny situations being provided for the purpose. The mould should be made fine, and the seed put in to the depth of about half an inch, three or four seeds in a place being sufficient.

Some gardeners properly advise the putting in a little dung in the situations where the seeds are to be sown, in order to forward the plants, and when they come up, to protect them by hand-glasses. This is particularly useful for the more tender kinds, and, in all the sorts, renders them considerably more forward.

When the plants are of some considerable growth, they should be thinned out to one or two good plants, and be plentifully supplied with water when the season is hot and dry, especially after they have begun to run or spread; as by this management they will extend very considerably, and grow with much greater vigour.

Where any of the sorts are cultivated for the purpose of ornament, they should be trained to strong stakes in order to show their flowers more fully, and appear more ornamental.

The seed should always be saved from the best and most perfectly ripened fruit of the different kinds, being carefully freed from the pulp, and preserved in a dry situation till the period at which it is wanted.

Method of Culture in the Water Melon kind.—The usual mode of culture in these plants, is by sowing the seed annually about the latter end of February or beginning of the following month, on pretty substantial hot-beds, keeping them protected by the glasses when the weather is bad; after the plants have attained a little growth, they should be pricked out into small pots, two plants in each, being replanted in the hot-bed. When they begin to throw out runners, they should be removed into the fruiting hot-bed in the same manner as practised for cucumbers and melons, only one pot of plants being employed for a two or three light frame; the beds being previously earthed over, and

hillocks raised to the height of twelve or fifteen inches in order to receive them.

The necessary after-management in regard to stopping the plants, the admission of air, the giving of water, covering the glasses in the nights, and keeping up the heat in the beds by linings, must be regulated in the same manner as for the melon. The spaces between the hills should be gradually earthed up, and the vines be trained so as to fill the frames without crossing, or being too much crowded. When the vines begin to shew and set fruit, the heat should be well supported and kept up, that they may be so brought forward as to ripen in due time. When the fruit has attained the state of maturity, it turns rather yellow, and becomes somewhat soft at the top, as in that of the melon.

In the cultivation and management of all the sorts and varieties of these plants, where the object is the fruit, such seed as has been kept some years should constantly be employed, as new seed is apt to grow too luxuriantly, and the vines of course afford but a very scanty supply.

CUCURBITACEÆ, in *Botany*, the forty-fifth natural order in the *Philosophia Botanica* of Linnæus, and the thirty-fourth in the *Posthumous Prælectiones* published by Giseke. In the *Philosophia Botanica* it contains the following genera: passiflora, feuillea, momordica, trichofanthes, cucumis, cucurbita, bryonia, sicyos, melothria, gronovia? In the *Prælectiones*, anguria and elaterium are added, and the whole placed in the following succession; gronovia, anguria, elaterium, sicyos, melothria, bryonia, cucurbita, cucumis, trichofanthes, momordica, feuillea, passiflora. In this order there are no proper trees, but some have a perennial, woody, climbing stem; in others the stem is herbaceous, but the root perennial; the rest are annual. The leaves in all are alternate and simple. The stipules always at the origin of the leaves. The glands are generally on the petioles, or at the base of the leaves, or in the leaf itself. All have tendrils by which they climb whenever they find suitable supports, without which they are more or less procumbent. The calyx is five-cleft or five-parted. The corolla is one-petalled, five-parted, but in many is so deeply cut as to seem five-petalled. The stamens are inserted, not on the receptacle, but on the inside of the calyx, to which the corolla is attached. The filaments are generally five, but so connected as to seem only three. The anthers are often united, so as to form one serpentine body, the apex of one growing to the base of another. The style is rather thick, and the stigmas most commonly three, often bifid. The fruit is generally fleshy, three-celled, having its seeds bedded in pulp, and on that account rather a berry than a pome. Most of the genera are either monoicous or dioicous. The fruit of none is positively wholesome, and of some highly pernicious, but of others is generally thought pleasant, and if eaten with caution, and not in too great quantities, is at least innocent.

The cucurbitaceæ are also the second natural order in the fifteenth class of Jussieu, of which he has given the following character. *Flowers* monoicous, or more rarely dioicous, or very rarely having in each perfect stamens and pistils, as in gronovia and melothria. *Calyx* (the corolla of Linnæus and Tournefort) superior, contracted, just above the germ, dilated beyond, quinquesid, shrivelling, falling off late, with five green appendages on the outside at the base of the bell-shaped expansion, (the calyx of Linnæus and Tournefort,) which may be called exterior segments of the calyx, since they fall off with it. *Corolla* none. *Stamens* of the barren flowers most frequently five, inserted into the contracted part of the calyx; filaments and anthers, in some distinct, in others entirely or partially united; anthers one-celled, oblong, fixed to the top of the filaments, often running

running into a twice-curved line, four of them generally in pairs, and the fifth solitary. *Germ* abortive, or barren. *Filaments* of the fertile flowers barren, or none. *Germ* inferior. *Style* one, or rarely several. *Stigma* most frequently divided. *Fruit* inferior, berried, often with a solid rind or shell, one-celled, with one or many seeds, or many-celled with many seeds; receptacles of the seeds lateral, or affixed to the inner surface of the fleshy part. *Seeds* cartilaginous or crustaceous; corculum flat, without a perisperm.

Root most commonly tuberous. *Stem* herbaceous, climbing or prostrate, zig-zag. *Leaves* alternate, furnished with axillary tendrils, simple, heart-shaped, or palmate, or rarely digitate, often rough, or studded with callous points. *Flowers* axillary, one or more on a peduncle. The genera are thus arranged by Jussieu. I. *Style* single. Fruit one-celled, with one seed. *Gronovia*, *ficyos*. II. *Style* single. Fruit one-celled, with numerous seeds. *Bryonia*, *elaterium*. III. *Style* single. *Fruit* many-celled, with numerous seeds. *Melothria*, *anguria*, *momordica*, *cucumis*, *cucurbita*, *trichosanthes*, *ceratofanthes*. IV. *Styles* several. *Dubious cucurbitaceæ*. *Feuillea*, *lanonia*. V. Allied to the cucurbitaceæ, distinguished chiefly by a superior germ. *Passiflora*, *murucua*, *taconia*, *papaya*.

Ventenat has the same genera, only adding *luffu* from *Cavanilles*, and omitting *feuillea* and *lanonia*, without taking them up in any other part of his work.

CUCURBITIFERA *arbor. subtundis foliis confertis*; Pluk. See CRESCENTIA *cucurbitina*.

CUCURBITIFERA *trifolia spinosa medica*; Pluk. See CRATEVA *masfnelos*.

CUCURBITINI LUMBRICI, in *Zoology*, are broad worms that breed in the intestines, like the seed of a gourd.

CUCURBITULA, in *Surgery*, a cupping-glass, or instrument, used in the operation of cupping. See CUPPING-Glass.

CUCURI, in *Ichthyology*, the Brazilian name of a fish of the shark kind, but not mischievous, called *caffion* by the Portuguese.

It is about two feet and a half long. The head ends in an hyperbolic figure, and the mouth is placed far below its end; it has only one row of teeth, and those very small; its eyes are of the size of a large pea; its belly is of a silver white. Willughby.

CUCURON, in *Geography*, a small town of France, in the department of Vaucluse; 9 miles S. of Apt.

CUCURUCU, in *Zoology*, the name of a serpent found in America, growing to ten or twelve feet long. It is very thick also in proportion to its length, and is of a yellowish colour, strongly variegated with black spots, which are irregularly mixed among the yellow, and often have spots of yellow within them, and are plainly black. It is a very poisonous species, and greatly dreaded by the natives; but its flesh is a very rich food, and greatly esteemed among them, when properly prepared. Ray.

CUD, in *Rural Economy*, a term applied to the imperfectly masticated food in animals of the cattle and some other kinds, which is brought back from the first stomach, to be chewed over again in a more gradual and deliberate manner, at the leisure of such sorts of beasts; being, after this process, transmitted into the second stomach to be digested more perfectly. When this process is lost, or the power of the animal to perform it suspended, it is supposed by some to be in a morbid condition, and to require the use of strengthening remedies of the acid and aromatic bitter kinds: whence, to chew the cud, signifies to ponder, think, or ruminate upon a thing.

CUD-Weed, in *Botany*. See ATHANASIA, GNAPHALIUM, and FILAGO.

CUDA, in *Ancient Geography*, a river of Spain, in the territory of the Lusitanians, which ran from the S. to the N., and discharged itself into the Durus.

CUDDALORE, in *Geography*, a town of Hindoostan, on the coast of Coromandel, in the Carnatic, situated near where St. David stood, now belonging to the English. It was taken by the French, under the command of general Lally, in the year 1758; and again in 1781; but in 1783 it underwent a severe siege by the British forces, under the command of general Stuart. At this time it was become the principal place of arms held by the enemy on that coast, who had made great exertions in fortifying it; and it was garrisoned by a numerous body of the best forces of France, well provided with artillery, and every necessary for a vigorous defence. The contest was severe, and at length the British forces proved victorious. Peace between the belligerent powers of Europe terminated the dispute. Cuddalore, where the French have had a factory, and within sight of Pondicherry, is naturally a very strong situation; and would have been the most commodious, perhaps, for the chief British settlement; since the security of Tanjore, and the convenience of supplies from it, must ever be a capital object. Besides, as the S.W. monsoon is the season of naval warfare, Pondicherry has the advantage of being to windward of Madras; and the French, at the same instant, accomplish the double purpose of keeping to windward, and of protecting their capital settlement; and receive assistance from it in return. The British fleet, in order to watch the enemy, retires 100 miles from their principal settlement, and receives only a precarious assistance from the shore; that is, from Cuddalore, or its neighbourhood, their usual station. N. lat. 11° 41'. E. long. 79° 45' 45".

CUDDAPAH, a town of Hindoostan, and capital of a province which bears the same name; belonging to the Nizam of the Deccan, through which passes the river Pennar. The town is situated on the route from Pondicherry and Arcot to Canoul; distant from Hydrabad S. 230 miles, from Madras N.W. 153 miles, from Nagpour S.W. 551 miles, and from Seringapatam N.E. 220 miles. N. lat. 14° 32'. E. long. 78° 54'.

CUDDAPAH, a country of Hindoostan, bounded on the N. by the country of Golconda, on the E. by the Carnatic, on the W. and S.W. by the Mysore; ceded to the Nizam of the Deccan by Tippoo Sultan. The principal towns are Cuddapah, Gandicotta, and Combam.

CUDDY, in a *First-rate Man of War*, is a place lying between the captain lieutenant's cabin and the quarter-deck; and divided into partitions for the mailer, and other officers.

It denotes also a kind of cabin near the stern of a lighter, or barge of burden.

CUDRESIN, in *Geography*, a town and bailiwick of Swisserland, in the canton of Berne, on the N.E. borders of the lake of Neuchatel. This town was taken by assault, in 1475, by the Swiss cantons, and allotted to the cantons of Berne and Friburg, who restored it to the duke of Savoy. In 1536 the inhabitants surrendered to the Berrois without resistance, under which canton it remains; 5 miles S.E. of Neuchatel, on the other side of the lake, and 2½ W. of Berne. N. lat. 46° 59'. W. long. 0° 44'.

CUDUPARITI, in *Botany*, Rheed. See GOSSYPIMUM *arborcum*.

CUDWORTH, RALPH, in *Biography*, the well-known author of the "Intellectual System," was born at Aller, in Somersetshire, in the year 1617. He was educated at first under his father, who was a man of some celebrity in the church; but at his death, which happened while our author

was only about eight years old, he was transferred to the tuition of his father-in-law, Dr. Stoughton. He made so rapid a progress in grammar learning, that at the age of 13 he was deemed fit for, and actually admitted, a pensioner of Emanuel College, Cambridge. Here he took his degrees, and about 1639, or 1640, he was elected fellow of his college, and became so eminent as an instructor of youth, that at one and the same time he had 28 pupils; a circumstance which, at that time, had never been known in the largest colleges in the university. Among the young men committed to his care were Mr., afterwards sir William Temple, and the celebrated Tillotson. He was shortly after presented to the rectory of North Cadbury in Somersetshire; and in 1642 published a treatise on the Lord's Supper, which gave rise to a long controversy, that seems to have been completely set at rest by an able work on the same subject, by Dr. Bell, prebendary of Westminster. In 1645 he was unanimously elected Regius professor of Hebrew; an office for which his great learning, and skill in the Oriental languages, peculiarly qualified him. He now devoted almost all his time to his academical pursuits and studies. In 1647 he printed a sermon, which he had preached before the house of commons: the dedication contained some admirable sentiments upon the nature of religion, and the value and importance of learning; which reflect much honour on the liberality of his principles, and was a well-timed reproof to the prevailing bigotry and fanaticism of his contemporaries. In 1651 he took the degree of doctor of divinity; and, because his income at the college was not adequate to his wants, he left the university; but was shortly after solicited to return, to which he consented, and was chosen master of Christ's College, Cambridge. Here he spent the remainder of his days. In 1656-7 he was appointed, by the grand committee for religion, to confer about a new translation of the Bible; whose labours were terminated by the dissolution of the parliament. Shortly after he obtained the vicarage of Athwell in Herts; and in 1678 he was installed prebendary of Gloucester. In the same year he published "The true intellectual System of the Universe;" a work full of capital reasoning, and containing much curious learning. The object of this publication was to confute the principles of atheism, which had been but too prevalent, as an opposite extreme to the cant and hypocrisy so common in the times of the commonwealth. Many excellent divines lifted up their voice, and exerted their pens against the atheism, profaneness, and irreligion, which was encouraged by the licentious court of Charles II.; but none with more vigour and success than Dr. Cudworth. "None better knew," says the learned Mosheim, "how to use the arms of reason and learning, to conquer the presumptuous ignorance of Hobbes, who had acquired a great reputation at court." The Intellectual System was only a part of what Dr. Cudworth had intended; but death prevented the completion of a labour, which, in its present unfinished state, has acquired for the author a large share of solid reputation. The candid critic will, however, see and acknowledge defects in this system. Dr. Cudworth was attached to the Platonic philosophy, and frequently, like his master, enveloped truth with mystery. In his physics he has adopted the corpuscular system, adding, to the doctrine of atoms, that of a certain middle substance between matter and spirit: to this he gave the appellation of "plastic nature," which he supposed to be the immediate instrument of the divine operation. This hypothesis was the foundation of a controversy between Bayle and Le Clerc. Dr. Cudworth died in 1688, at Cambridge, in his 71st year. He left behind him other works, published, and in MS.; the latter, after many re-

volutions, have found a place in the British Museum. They were left by the author to lady Masham, his daughter, who preserved them with pious care so long as she lived. They were afterwards sold to Mr. Davis, a bookseller in Piccadilly, who parted with them, as the MSS. of Mr. Locke, to the proprietors of a Bible that was edited by Dr. Dodd. This, says Dr. Kippis, was the origin of Dr. Dodd's Bible. Such extracts having been made as were deemed necessary for the purpose, the originals were returned, when Mr. Davis sold them outright for 40 guineas, as the MS. of Locke. The deception was soon discovered, and their proper owner traced. The purchaser claimed a return of his money; and they were at length negotiated for by the curators of the British Museum, as the remains of the excellent Dr. Cudworth. Of their author it may with strict justice be affirmed, that he was not only distinguished by very extensive learning and profound knowledge in metaphysics and philosophy, but by exemplary piety, and great moderation and rectitude of character, which rendered him an honour to the institutions where he presided, to the university of Cambridge which he adorned, and to the church and age in which he lived. Mr. Granger observes, that Dr. Cudworth held the same rank in metaphysics that Dr. Barrow did in sublime geometry; and his daughter bestyles the learned and accomplished lady Masham, whose memory deserves to be held in high honour, both for her own attainments, and her unshaken friendship to Mr. Locke. *Biog. Brit. Mosheim.*

CUE, or QUEUE, the hair tied in form of a tail. Military men, and particularly soldiers, have been made to wear queues of different forms, at different times.

CUE, an *item*, or *innuendo*, given to the actors on the stage, what, or when, to speak. See PROMPTER.

CUE, in *Geography*, a town of Persia, in the province of Adirbeitzan; 100 miles S.S.W. of Tauris.

CUENCA, a jurisdiction or province of the vice-royalty of New Granada, or Santa Fé, in South America, bordering on the southern parts of Riobamba, and divided into two departments, of which the capital is one, and that of Alausi the other, which reaches to Riobamba, is governed by a deputy of the corregidor, and besides the Asiento, contains four villages; but that of the city of Cuenca includes 10. This district, which is situated on the table land of Quito, is of benign temperature, producing abundance of cattle, sugar, cotton, and grain, and has considerable manufactures of cotton cloths. The terrible earthquake in 1797, which totally ruined the city of Riobamba, so that of 9000 persons, only about 400 escaped, seems not to have extended south so far as Cuenca. Among the great variety of mines in this province, those of gold and silver are not, according to the common opinion, the least numerous. From a story, which is of ancient date, and which has descended from one generation to another, related by Ulloa, it is inferred, that a hill in this district, called "Supay-urca," or the Devil's-hill, contains an inexhaustible treasure.

CUENCA, the capital of the above-mentioned jurisdiction, situated in S. lat. 2° 53' 49", and long. 29° 25' W. of the meridian of Quito, on a spacious plain, along which, at about half a league N. of it, runs a little river, called Machangara; and close to the S. side of the town runs another, known by the name of Matadero. Besides these, at the distance of a quarter of a league, runs another, called Yanuncay; and about the same distance is another, named Los Banos, from a village of that name through which it runs. All these rivers are in some seasons fordable; but at others, can only be crossed with safety over the bridges.

The plain in which Cuenca stands extends about six leagues from N. to S ; and the four rivers form, at a small distance, by the conflux of their streams, a very large river. To the S. of the town is another plain, about two leagues in extent, and exhibiting, by its great variety of regular plantations of trees, a very delightful appearance through the year. The streets of this town are straight, and of a convenient breadth; the houses of unburnt bricks, are tiled, many of them being of one story; and the suburbs, inhabited by the Indians, are mean and irregular. The town is supplied with water by several streams; and on account of its admirable situation, and the fertility of the adjacent soil, it might be rendered the paradise, not only of the province of Quito but of Peru itself; but its advantages are, either through ignorance or indolence, not duly improved. Cuenca was founded in the year 1557, by Gil Ramirez Davalos. It contains three parishes; that of the great church consists of Spaniards and Mestizos; the two others, called San Blas and San Sebastian, are appropriated to the Indians. Here are convents of Franciscans, Dominicans, Augustines, and the fathers of Mercy; a college of Jesuits, and two nunneries. Here is also an hospital, though so ill managed as to be in ruins. The magistracy is composed of regidores and ordinary alcaldes, chosen annually; and their head is the corregidor. Here is also a chamber of finances; the revenues of which consist of the tribute of the Indians of this department, together with that of Alausi, the jurisdiction of Loja, and the government of Jean de Bracamoros; the duties on provisions, and the customs collected at Naranjal. The inhabitants are of a very indolent temper; and the vulgar are rude, vindictive, and very profligate. The women, however, are generally very industrious: they spin and weave bays, famous for their quality and brilliancy of colour, in every part of Peru. They also buy and sell, and manage the whole of the little commerce, by which their families are supported; whilst the males surrender themselves to sloth, and its concomitant vices. The whole number of inhabitants in this town is computed at 20 or 30,000 persons; and those both of the town and jurisdiction are commonly known by the name of Morlacos. The adjacent country is finely interspersed with farm-houses and plantations of sugar-canes; some parts are cultivated for corn, others appropriated to sheep and horned cattle, from the milk of the last of which they make great quantities of good cheese.

CUEÇA, a town of Spain, in New Castile, anciently called *Conça*, the see of a bishop, suffragan of Toledo, situated between two lofty mountains and two small streams, which form the Xucar; taken by the earl of Peterborough in 1706, and soon retaken by the duke of Berwick; 75 miles E. of Madrid, and 100 W.N.W. of Valencia. N. lat. 40° 10'. Long. 14° 35' E. of the Peak of Teneriffe.

CUERA, or **ZUERA**, a town of Spain, in Arragon, on the Gallega; 10 miles N. of Saragossa.

CUERENHART, or **COORNHART**, **DIRICK**, or **THEODORE VOLKHART**, in *Biography*, an engraver and a literary character. was born at Amsterdam in the year 1522. He resided a long time at Haarlem, where, in concert with other artists, he engraved many subjects from the scriptures, from the designs of Martin Hemelick, Francis Floris, and other masters. His plates are wrought in a careless negligent manner, imitating pen-drawing. They are chiefly middling-sized, engt. ways, and marked sometimes with his name, at others with a cypher, composed of D. V. & C.

Cuerenbert is so lets remarkable for his engravings than for the singular adventures of his life, which was published at Amsterdam at the head of his works in 1630. The

strange opinions which he maintained, in his several religious disputes, occasioned him to be frequently imprisoned, and at length banished his native country, when he retired to Gouda, where he died in 1590. He had the honour to count the celebrated Henry Gotzcius amongst his disciples. Huber. *Mann-l des Arts*.

CUERNABACA, or **CORNAVACA**, in *Geography*, a town of N. America, in the province of Mexico; 20 miles S.S.W. of Mexico.

CUERPO. *To walk in cuerpo*, is a Spanish phrase for going without a cloke; or without all the formalities of a full dress.

CUERS, in *Geography*, a town of France, in the department of the Var; 12 miles N.E. of Toulon, and 9 miles N. of Hières. It is the chief place of a canton, in the district of Toulon, with a population of 4890 individuals. The canton itself has 14,899 inhabitants, in 9 communes, upon a territorial extent of 507½ kilometres.

CUEYTE, a river in the island of Cuba, which abounds with alligators.

CUFA, or **СУРНА**, a town of Asiatic Turkey, in the Arabian Irak, near the frontiers of Arabia Deserta, on the branch of the Euphrates called Nahr-Isa; 60 miles from Bagdad. The *Cufic* characters, which prevailed among the Arabians for about 300 years, were denominated from this place, where they are said to have been invented. The Cufic alphabet, which continued to be used in writing so late as the 10th century, and on coins down to the 14th century, is now found only in the oldest Mahometan MSS. About the year 920, a new system of writing, called "Nikki" was formed and introduced, which, with some variation, still continues to be the general hand-writing of the East. See *ARABIC Language*.

CUFF, or **CUFFE**, **HENRY**, in *Biography*, a distinguished scholar, and secretary to the unfortunate earl of Essex, was born at Hinton in Somersetshire, where he received the early parts of his education, and from thence removed to Trinity College, Cambridge. He was greatly distinguished among his contemporaries, and became fellow of the college. The impetuosity of his temper led him into difficulties, and a display of his wit caused him to be banished from his college. His reputation was, however, so considerable, that he was invited to, and admitted a member of, Merton College, where he took his degree of M. A., was made fellow, and afterwards promoted to the Greek professorship; and was chosen proctor of the university. When the earl of Essex was appointed to the lord lieutenancy of Ireland, Mr. Cuffe was appointed his secretary, obtained the noble lord's confidence, and was probably regarded more as a friend than a servant in this high station. The earl was charged with projects of ambition very unsuitable to the views of any subject. Conscious, perhaps, of his master's innocence, or indignant at the treatment he had met with, Cuffe repelled the idea of that submission which was recommended by some of his other and more prudent friends. The earl at length fell a victim to his imprudence; was tried, and convicted, and suffered death. Previously to the execution of the sentence, he charged his secretary with being not only accessory to, but author of, all his misfortunes. On this charge, which was aggravated by other circumstances, he was brought to trial, convicted, and suffered death at Tyburn. He acted with great firmness and heroism, repelling with becoming indignation the several insinuations made against him. By Camden, lord Bacon, and sir Henry Wootton, his memory was treated with a severity, which later writers have thought in a great measure unmerited.

He

He left behind him some MSS. ; of these one was published about six years after his death, entitled, "The Differences of the Ages of Man's Life, together with the original Causes, Progress, and End thereof." Biog. Brit.

CUFRATENSIS, in *Ancient Geography*, an episcopal town of Africa, in the Byfacene territory.

CUGUACUARA, or CUGUACUARANA, in *Zoology*, the name of an American beast of prey, the brown Patagonian cat, usually confounded with the tyger, and described by Maregrave as one of the three species of American tygers, the *jaguara* and *jaguarcte* being the two others. It is the *Cougour* of Buffon, and the *FELIS Concolor* of Gmelin ; which see.

CUGUACUETE, and CUGUACUAPARA, the Brazilian names of an animal of the *Cervus* kind, seeming to be the male and female of the same species, and not distinct animals. The former, according to Maregrave, has no horns ; but the cuguacuate of Piso has palmated horns, and is probably the male ; the horns are composed of three branches ; they send out one near the insertion, and from this they run up single to the extremity, where they are bifid. As in the roe-deer, the female has no horns, it is probable that the individual pointed out by Maregrave was the female. Upon the whole, the descriptions given of these animals, by both these writers, demonstrate that they are roe-bucks, similar to those of Europe. Marcg. Bras. 235. Piso Ind. p. 97, 98. Smelley's Buffon, vii. 31.

We have not seen the animal in England ; but its horns, which are very singular in their shape, are preserved in the museum of the Royal Society. This is the animal which Johnson has figured under the name of the *capreolus marinus*. Tab. 33.

CUGUPUGUACU, a name by which Maregrave calls a Brazilian fish of considerable size, and a very good taste, the *PERCA guttata* of Gmelin ; which see.

CUI *ante Divortium*, in *Law*, a writ, which a woman divorced from her husband hath, to recover lands or tenements from him to whom her husband alienated them during marriage ; because during the marriage she could not gain-say it.

CUI *in Vita*, is a writ of entry, which a widow hath against him to whom her husband alienated her lands or tenements in his life-time ; specifying, that, during his life, she could not withstand it.

CUJAS, JAMES, in *Biography*, a celebrated French jurist, was born at Toulouse in 1750. His origin was low, but his talents and industry overcame every obstacle to his rising greatness. He attained a speedy and a deep knowledge of the learned languages. Ferrier was his preceptor in the law ; but the progress which he made in ancient jurisprudence was the result of his own researches. He took for his guides, and as handmaids to the science, the analogy of words, and the facts in history. He became a public professor in his native city ; from thence he was invited to the university of Cahors ; and, after some other changes, he became, at the urgent request of Emanuel Philibert, duke of Savoy, professor at Turin. He finally returned to Bourges, where he died in 1590, at the age of 70. His memory has been honoured by the notice and applause of Joseph Scaliger and De Thou. The former speaks of him as a man of a social and most friendly disposition, who not only lived on familiar terms with his pupils, but might truly be denominated their father. Under Cujas some of the most celebrated magistrates in France were educated ; and from him they imbibed liberal and patriotic principles. De Thou insinuates that his life had been threatened by the bigots of

the time ; and to his deep regret for the subversion of all justice, and regard to the public good, that writer imputes the death of Cujas, at an age beyond which he might have been expected, from the soundness of his constitution, to have lasted. His works are still in considerable reputation. They were first printed together in 5 vols. folio, at Paris, 1584. Mereri.

CUJAVIA, in *Geography*, a province of the grand duchy of Warsaw, which, since the peace of Tilsit, belongs to the king of Saxony, and had formed a part of the late acquisitions of Prussia from Poland. It is irrigated by the Vistula ; has a bishop, who resides at Inowladislaw ; and contains the two palatinates of Brzesc or Kujawski and of Wladislaw or Ino Wladislaw, Young Wladislaw. This country is uncommonly fertile, and has many lakes which abound with fish.

CUJAVUS, in *Botany*, *agrestis* ; Rumph. See *PSIDIUM pomiferum*.

CUJAVUS *domestica* ; Rumph. See *PSIDIUM pyriferum*.

CUICHOCA, in *Geography*, a lake of S. America, in the province of Quito and jurisdiction of Otabalo, about a league in length, and half a league in breadth ; situated in a plain, on the side of a mountain of the same name. Near the middle of this lake are two islands, abounding with wild cuyes, a species of rabbits, and deer, which often swim to the main land ; but, when pursued by the hunters, disappoint them by gaining the lake, and swimming back to their retreat.

CUICULUM, or CUICULI, in *Ancient Geography*, an episcopal town of Africa, marked in the Itinerary of Antonine ; 25 miles from Sitifi.

CUJETE, in *Botany*, Plum. See *CRESCENTIA*.

CUIL, in *Ornithology*, a name given by Buffon to the *CUCULUS honoratus* of Gmelin ; which see.

CUILLE', in *Geography*, a small town of France, in the department of the Mayenne ; 21 miles N.W. of Chateau Gontier.

CUILLER a Canon, Fr. a sort of sheet of copper or brass, rounded, and one-third open. It is of different sizes, and serves for drawing or taking out the powder of the charge of a cannon.

CUILLI. See *CULLY*.

CUILLIER, in *Ornithology*, a name given by Buffon to the *CANCROMA canrophaga* of Gmelin.

CUIRASSE, a piece of defensive armour, made of an iron plate well hammered ; serving to cover the body, from the neck to the girdle, both before and behind.

Some derive the word, by corruption, from the Italian *cuore*, *heart* ; because it covers that part : others from the French *cuir*, or the Latin *corium*, *leather* ; whence *coriaceus* : because defensive arms were originally made of leather.

The cuirasse was not brought into use till about the year 1300, though they were known both to the ancient Greeks and Romans in different forms.

Hence, *cuirassiers*, the cavalry armed with *cuirasses*.

In the Roman calendar, we find the name of St. Dominic the *cuirassed* ; a title given to a saint of the eleventh century, from his constant wearing of an iron *cuirasse*, by way of penance.

CUIRASSIERS, are a sort of heavy cavalry armed with cuirasses. The different German powers had regiments of cuirassiers, and have now troops under this denomination. The late king of France had also one regiment of them ; and Napoleon Buonaparte has cavalry now that go by that name, and are esteemed the best that he has.

We have had none, however, in England since the revolution.

CUIRIRI, in *Ornithology*, the name of a Brazilian bird of the *Lanius* or shrike kind, in no respect differing from the *pitanguaguacu*, but that it has a yellow spot upon its head. Probably this is the male of the same species. See **LANIUS Pitangua**.

CUISSARS, or *Cuiffards*, Fr. were plates or scales made of beaten iron, which were put on below the under part of the cuirasse, and served for covering and protecting the thighs. This armour was called *Cuiff*.

CUIT, in *Ornithology*, a name given by Buffon to the **CORACIAS Bengalenfis**.

CUITE, Fr. a technical term to express the preparation of saltpetre for the making of gun-powder. See **SALTPETRE**.

CUITPALLI, in *Natural History*, the American name of a very beautifully variegated stone, found in New Spain, and some other places: its name expresses the painted stone. It is a species of jasper of a beautiful green, variegated with very beautiful lines, and clouds of black, and is in some parts transparent.

CUIZEAUX, in *Geography*, a small town of France, in the department of Saône and Loire, 30 miles S.E. of Châlons. It is the chief place of a canton, in the district of Louhans, with a population of 1694 individuals. The canton itself contains 10 communes and 9760 inhabitants, upon a territorial extent of 150 kilometres.

CUIZERY, a small town of France, in the department of Saône and Loire, with 1301 inhabitants, 18 miles S. of Châlons. It is the chief place of a canton, which reckons a population of 8816 individuals, in eleven communes, upon a territorial extent of 122½ kilometres in the district of Louhans.

CUL DE CHANDRON, Fr. the rounded bottom of the funnel, or the excavation of a mine after it has produced its effect.

CUL de Cobe, in *Geography*, a bay of the island of Martinico, on the N. part of the Cul de Sac Royal.

CUL de four, a sort of low, spheroidal vault, oven-like.

Coul de four of a niche, denotes the arched roof of a niche on a circular plan. See *Mem. Acad. Scienc. an. 1719*, p. 363.

CUL de lamp, a French term, properly signifying the bottom of a lamp. It is applied in architecture to several decorations, both of masonry and joinery, used, in vaults and ceilings, to finish the bottom of works, and wreathed somewhat in manner of a *testudo*; particularly a kind of pendentive in Gothic vaults.

CUL de Sac, in *Geography*, a general term for a bay in the West India islands.

CUL de Sac des Anglois, a bay of the island of Martinico, on the S.E. coast, a little to the south of Cape Ferrar.

CUL de Sac François, a bay of the island of Martinico. N. lat. 14° 34'. W. long. 60° 53'.

CUL de Sac, Grand, a bay in the W. coast of the island of St. Lucia.—Also, a bay on the N. coast of the island of Guadaloupe. N. lat. 16° 30'. W. long. 62° 53'.

CUL de Sac Marin, a bay on the S. coast of the island of Martinico. N. lat. 14° 31'. W. long. 60° 45'.

CUL de Sac, Petit, a bay of Guadaloupe, 7 miles S. of Grand Cul de Sac.

CUL de Sac, Robert, a bay of the island of Martinico, on the east coast. N. lat. 14° 34'. W. long. 60° 59'.

CUL de Sac, Royal, a bay on the W. coast of the island of Martinico. N. lat. 14° 30'. W. long. 60° 59'.

CUL de Sac, Vache, a bay of the island of Martinico. N. lat. 14° 31'. W. long. 60° 57'.

CULANT, a small town of France, in the department of the Cher; 15 miles E. of Châtres, and 12 miles S.W. of St. Amand.

CULARO, in *Ancient Geography*, a town of Gallia Narbonnensis, which separated the Allobroges from the Vacautiani. It was rebuilt by Gratian, and called Gratianopolis; now Grenoble.

CULATÉ, is the part beyond the vent, or inner mould of a piece of ordnance, and which terminates in a large knob or button of metal.

CUL-BLANC, in *Ornithology*, a name given by Buffon to the **MOTACILLA Oenanthe**.

CULBUTE, in *Midwifery*, a supposed evolution of the fœtus in the womb, occurring about the end of the seventh month of pregnancy. See **BIRTH**; also **FŒTUS, position of**, in the womb.

CULBUTER UNE COLONNE, Fr. To overthrow a column. This phrase is frequently made use of when cavalry attack infantry, and throw them into confusion by a brisk and rapid charge.

CULCASIA, in *Botany*, a name given by some of the old writers to an Egyptian plant growing near the seashores. It is by many supposed to have been the *colocasia*, but improperly. The resemblance of the name was the only thing that gave the idea of its being this plant; but the virtues attributed to it, and the uses it was put to in the common affairs of life, shew that it was the *kali* or *cali*, the plant of whose ashes they made a salt useful in many arts, and still the basis of the glass and soap manufactures, and called by Avicenna *ujjen*.

CULCITÆ, Lat. Beds which, of some kind or other, have been in use from the highest antiquity. They were first of herbs or grass, then of feathers, and afterwards of wool. (See **BED**.) In proportion as the Romans departed from the severity of their original mode of living, they wished to have beds with them when embodied as soldiers and on actual service, in spite of prohibitions to the contrary. Scipio Africanus Numantinus observing the prohibitions to be useless, set himself an example of submission and self-denial, by forbidding a bed to be prepared for him, and reposing on a bundle of hay only. When a general such as Scipio gave so fine an example of self-denial, even the softest and most effeminate mult have accustomed themselves to the ground. It does not from thence follow, however, that the commander of an army should sleep on the bare ground. It is sufficient that he has once set the example. For he in general stands more in need of rest than any other man, as his sleep is sometimes frequently interrupted during the night; and his spirits, exhausted by the fatigues of watching, require to be recruited, to enable him to resume his labours and attend to the duties of next morning.

CULCITANUS, in *Ancient Geography*, an episcopal see of Proconsular Africa.—Also, a see in the Byzacene territory.

CULCUA, a Roman colony of Africa, placed by Ptolemy in Numidia.

CULCUL, a sort of grain brought from Egypt to Constantinople, where it is much esteemed, especially when fresh. Authors are not agreed what plant it is produced from.

CULDEES, or **KULDEES**, in *Church History*, a designation given to the monks, or priests, in Scotland, in the first ages of Christianity, whence the term passed into Ireland.

They were called *culdees*, quasi *cultores dei*, from their great piety and devotion. Others, however, derive their name from the cells or cells in which they lived. This monastic order commenced, both in Scotland and Ireland, about the middle of the 6th century: and St. Columba is acknowledged to be its founder. This eminent person, distinguished by a greater degree of useful knowledge and rational piety, than those which generally prevailed at that early period, arrived from Ireland and succeeded Palladius, at a considerable interval after his departure or death; and soon gained such an ascendant both over princes and people, that he became a kind of dictator among the Scots and Picts, in civil as well as religious matters, for more than 30 years. Having obtained a grant of the small island Hù, Hu, or Iona, one of the Ebudæ or Hebrides, he there built a monastery, which was long considered as the mother and queen of all the monasteries in Scotland; and its abbots, though only presbyters, were respected as the chief ecclesiastical persons among the Scots, out of regard to its founder St. Columba, who, as Bede informs us, was a presbyter, and not a bishop. In this monastery many excellent persons received their education, and were sent from thence, not only to instruct the Scots and Picts, but even to convert the Saxons. These missionaries were a kind of presbyters, who lived in small societies, and travelled over the neighbouring countries, preaching and administering the sacraments. To each of their cells there was one who had some kind of superintendency over the rest, managed their affairs, and directed their missions; but whether or not he enjoyed the title and authority of a bishop in this period, is not certainly known. The council of Ceale-hythe, held A. D. 816, decreed, that no Scotch priest should be allowed to perform any duty of his function in England; and it therefore seems to have suspected that they had no bishop; for, indeed, the chief reasons assigned by that council for refusing to keep communion with these Scots Culdees were, that they had no metropolitans amongst them; that they paid little regard to other orders; and that the council did not know by whom they were ordained, *i. e.* whether they were ordained by bishops or not. (Spelm. Concil. t. i. p. 329.) The rectors or bishops of the several cells of Culdees were both chosen, and ordained, or consecrated, by the members of these societies; and this was probably the ground of the dissatisfaction expressed by the council of Ceale-hythe. When the cells or monasteries of Scotland came to be enlarged, better built, and better endowed, they were long after this possessed by these Culdees, or secular clergy, who had the privilege of choosing the bishops in those places where sees of bishops were established. (Boeth. Hist. Scot. l. 10.)

Few writers have done justice to the Culdees. They seem to have been too much attached to simple truth and pure Christianity, to find favour with those who aimed at wealth and power, and enjoyed the benefit of human impositions and prevailing ignorance. Even Bede, venerable as he was, though he bestows upon them great and just commendation, cannot avoid passing some censure upon them, and seems to have regarded them as schismatics, in the worst sense of that word. "They followed," says this ancient writer, "uncertain rules in the observation of the great festival; only practising such works of charity and piety as they could learn from the prophetic, evangelical, and apostolical writings;" thus insinuating some reflection both on Columba and his successors. Ledwich, in his 'Antiquities of Ireland,' pronounces upon them an high eulogium. "It is true," says he, "they did not adopt the corruptions of the Anglo-Saxon church, or the super-

sitions which had contaminated Christianity for centuries. They preserved their countrymen from the baleful contagion, and at length fell a sacrifice in defence of their ancient faith. Superstition found them her most determined foes. The Culdees continued, until a new race of monks arose, as inferior to them in learning and piety, as they surpassed them in wealth and ceremonies, by which they captivated the eyes, and infatuated the minds of men. The conduct of the Romanists towards them was in every place uniformly persecuting. The Romish emissaries were obliged to exert all their cunning to remove the prejudices in their favour, and where force could not, seduction often prevailed: at last they lost all their privileges, their old institutions, and retained barely the name of their pristine celebrity." The overthrow of the Culdean worship was finally effected by pope Adrian, A. D. 1155, when he claimed the sovereignty of these islands, and, in the plenitude of his presumption, bestowed Ireland on Henry II. Mr. Ledwich informs us, that in Mondincha, an island of Ireland, in the county of Tipperary, stood a Culdean abbey and church, where several of the order resided; and it appears that, in 1185 they "had not conformed to the reigning superstition; they devoutly served God," says this historian, "in this wild and dreary retreat, sacrificing all the flattering prospects of the world for their ancient doctrine and discipline."

CULÈ'E D'UN PONT, Fr. the arch of a bridge next to the land. The phrase is also used by some writers to denote the butment of masonry which supports that arch.

CULEMBACH, in *Geography*, a district or marquise of the circle of Franconia, in Germany; bounded on the W. by the bishopric of Bamberg; on the S. by the territory of Nuremberg; on the E. by the palatinate of Bavaria and Bohemia; and on the N. by Voegtland and part of the circle of Upper Saxony. It is about 50 miles long, from N. to S., and 30 broad from E. to W. It abounds with forests and high mountains; the most considerable of the latter are those of Fichtelberg, which are covered with pine-trees. From these mountains spring four large rivers, *viz.* the Maine, the Sala, the Eger, and the Nago. See BAREITH.

CULENBACH, a town of Germany, the capital of the above-described marquise. It is well fortified, and is situated at the confluence of two branches of the river Maine. It was pillaged and burnt by the Hussites in 1430, and by the inhabitants of Nuremberg in 1573. N. lat. 50° 12'. E. long. 11° 28'. See BAREITH.

CULEMBURG, a town of the United States, in Guelderland, situated on the S. side of the Leck. The lords of Culemburg were very powerful in the year 1150. In the year 1555 it was erected into a comté by Charles V. in favour of Florent de Pallant, one of the confederate nobles, who presented the remonstrance against the inquisition, and in favour of liberty of conscience, to the dukes of Parma, April 5, 1566. During the succeeding troubles, he retired to Culemburg, where he lived peaceably, and died in the year 1598. As he died without children, the comté descended to the comte de Waldeck, who had married the heiress by a collateral line; 27 miles S.S.E. of Amsterdam, and 16 N. of Bois-le Duc.

CULERA, CAPE, a cape of Spain, on the coast of Valencia. N. lat. 39° 8'. Long. 16° 25' E. of the Peak of Teneriffe.

CULEVRAS, CAPE, a cape of America, on the N. coast of the isthmus of Darien. N. lat. 9° 36'. W. long. 78° 52'.

CULEUS, the name of a measure of liquids, the greatest

of all the measures among the Romans: it contained twenty amphoræ. Columella reckons the culeus of wine, at the vineyard, to be worth three hundred nummi, or seventy-five denarii, that is, according to the English rate, a hundred and forty gallons, three pints and a half, for two pounds eight shillings, and fivepence farthing, which is about a halfpenny the pint. Columella, lib. iii. cap. 3.

The culeus is by others described to contain 160 congii, or 960 sextarii. We read of *dolia culearia*, and *sesquiculearia*, the latter of which must have been very large, being about $3\frac{1}{2}$ hogheads, and therefore larger than our pipes.

The word culeus is used also by some Roman authors for a leather sack.

CULEX, in *Entomology*, a genus of the dipterous order. The mouth is furnished with a single-valved exerted flexile sheath inclosing five bristles; feelers of two or three joints; antennæ approximate and filiform.

These insects are of the gnat tribe, and subsist on the blood and juices of larger animals, which they suck by means of their proboscis. In the larva state they live in stagnant waters; they have a small cylindrical respiratory tube near the tail, and the head armed with hooks by means of which they seize upon and secure their prey. The pupa is incurvated and subovate with respiratory tubes near the head. The genus contains many species not described by authors.

Species.

PIPIENS. Cinereus with eight brown rings. Linn. Fn. Suec. &c.

Inhabits Europe and the greater part of Asia and America, about watery places, and is every where known by its shrill buzzing noise, and severe puncture. It appears in immense numbers in Lapland during their summer. This is the common gnat of our country. The antennæ of the male are pectinated.

According to Kalm the Musquetoës are a variety of this insect.

ANNULATUS. Brown; abdomen and legs annulated with white; wings spotted with brown. Fabr.

Found in Europe, chiefly in Germany and Denmark. It is the same size as the former; the proboscis is half the length of the body; segments of the abdomen edged with white, and the first segment marked with a white dorsal line.

TRIFURCATUS. Brown, with pale lines on the thorax. Reaum.

Inhabits swamps and marshes of Europe.

CILIARIS. Brown-testaceous; wings fringed. Gmel.

A rare species found in Europe; its size is half that of the common gnat; the antennæ black with verticillate hairs; abdomen brownish.

CUTESCENS. Yellow; wings hyaline; rib yellowish. Fabr.

Found in marshes in Denmark.

HÆMORRHOIDALIS. Brown; abdominal margin fringed with rufous hairs. Fabr.

The largest of the gnat tribe. The species is a native of Cayenne. The antennæ are beset with thick verticillate hairs, the first joint naked, and of a shining blue colour; head brown, with the crown shining blue; legs blue, thighs testaceous beneath; wings white, with a brown rib.

CILIATUS. Back, with two yellow dorsal lines on the thorax; legs yellow. Fabr.

Smaller than the last, and inhabits Carolina.

PULICARIS. Brown; wings white with three dusky spots. Linn.

Inhabits Europe and America.

REPTANS. Black with hyaline wings; legs black with a white ring. Linn.

Very abundant in the north of Europe, and is extremely troublesome.

MORIO. Black, with white wings; hind-thighs clavate and ferrated. Fabr.

A species found in England; the antennæ are beset with tufted hairs, and the anterior thighs are pale at the base.

EQUINUS. Black; abdomen brown; front white. Linn.

Inhabits Europe, and is often found secreted among the hairs of horses.

STERCOREUS. Testaceous; wings reticulated; line on the thorax, and three on the abdomen blackish.

Native of Europe; frequent on the dung of quadrupeds.

VARIEGATUS. Cinereous; legs varied, black and white. Schranck.

Found in Austria. Head and poisers black; wings fringed.

ARGENTELUS. Back covered with silvery scales. Poireret.

Described in Journ. de Physique as a native of Barbary, which country it infests in great abundance.

CULIACAN, in *Geography*, a province of Mexico, in the domain of New Biscay, lying on the gulf of California, and bounded on the N. by Cinaloa, on the E. by New Biscay, on the S. by the Pacific Ocean, and on the W. by the fore-mentioned gulf, or Vermilion sea; about 240 miles long, and 200 broad. The soil is fertile, and the air salubrious. It has some silver mines. The chief towns are Culiacan, Petatlan, and St. Miguel.

CULIACAN, the capital of the above-mentioned province, situated on a rivulet which runs into the river Umay, called also the river of Culiacan; 481 miles N.W. of Mexico. N. lat. $24^{\circ} 32'$. W. long. $106^{\circ} 23'$.

CULINARY, an epithet frequently added to *fire*; determining it to be a common fire, excited in wood, coals, or other ordinary fuel; in contradistinction to solar fire, or that raised by the action of a burning glass; also to central fire; to animal fire, &c.

The word is formed from the Latin *culina*, kitchen; this being the chief place of such fires. See FIRE.

CULINARY Plants, in *Gardening*, are all such plants as are made use of in the art of cookery, as articles of food, or for the purpose of garnishing and ornamenting various kinds of dishes.

CULL, anciently *Collops Magnus*, or *Cullu*, in *Geography*, a poor sea-port town of Africa, situated at the bottom of the gulf of Stora, in the eastern province of Algiers, with a tolerable port, into which flows the river Zeamah. The French African company has a small factory in this place, where they purchase, as they do at Bona, corn, oil, leather, wax, and wool, and constantly keep a resident agent, who has charge of the correspondence between Bona, Algiers, La Calle, and Marseilles. N. lat. $36^{\circ} 50'$. E. long. $6^{\circ} 40'$.

CULLEN, WILLIAM, in *Biography*, an eminent practitioner, and teacher of medicine, was born at Lanerk, in Scotland, in the year 1712. His parents, who were respectable, but not wealthy, after giving him the usual school education of the country, put him apprentice to a surgeon and apothecary at Glasgow. At the conclusion of the term of his apprenticeship, he was engaged as surgeon to a vessel trading to the West Indies, in which he made several voyages. Quitting at length this situation, he settled as surgeon and apothecary at a village in the parish of Shotts, whence, after a short stay, he

C U L L E N.

removed to Hamilton. He here formed a connexion with Mr., afterwards Dr. William Hunter. As they had not sufficient business to employ the whole of their time, with a view of turning their leisure to advantage, and of improving themselves in their profession, they agreed, each of them in their turn, to pass a winter at some university. Mr. Cullen went the first winter to Edinburgh, and entered himself as pupil in the several classes. That he attended diligently to his studies while here was manifest, by his being soon after able to commence teacher. The following winter Mr. Hunter came to London, and entering into the service of Dr. William Douglas, as assistant in his dissecting room, he soon made himself so useful as to induce the Dr. to offer him a share in his lectures, an offer too advantageous to be rejected by the young adventurer; though by this means the partnership engagement between Mr. Cullen and Dr. Hunter was dissolved, it made no breach in their friendship. They continued to correspond with each other during the remainder of their lives. Cullen, while he remained at Hamilton, had the good fortune to be introduced to the duke of Argyle, while on a visit in the neighbourhood, and to assist him in some chemical pursuits. But a more fortunate circumstance was his being sent for to the duke of Hamilton, who had been suddenly seized with a complaint, sufficiently violent to alarm his family for his safety. The method adopted by Cullen was so judicious as to give relief to his noble patient, and to gain him the entire approbation of Dr. Clarke, who lived at some miles distance, and had also been sent for. About the same time he married Miss Johnson, the daughter of a neighbouring clergyman, by whom he had several children. In the year 1746, he took the degree of doctor in medicine, and was appointed teacher of chemistry in the university of Glasgow, to which place he had removed a small time before. He had now an opportunity of displaying his talents, which in a particular manner fitted him for the office of a teacher. His fondness for method and arrangement, his distinctness of enunciation, his vivacity of manner, and his knowledge of the science he taught, made his lectures peculiarly interesting to his pupils. In the mean while his reputation, as a practising physician, kept pace with his fame as a teacher, so that there were few cases of difficulty in which he was not consulted. In 1751 he was appointed professor in medicine to the university; and in 1756, on the death of Dr. Plummer, chemical professor at Edinburgh, he was invited to accept that chair. This offer was too advantageous to be refused. Quitting, therefore, his engagements at Glasgow, he went to Edinburgh, and in October in the same year, commenced his lectures. He soon became as great a favourite there as he had been at Glasgow, and found his course attended by a greater number of pupils than any of the other professors, excepting the teacher of anatomy. For this he was indebted not only to the great attention he paid to the business, and his complete knowledge of the subject, but to his address, in managing his pupils, whom he treated with kindness and familiarity, inviting them to his house, allowing them the use of his library, and readily giving his advice and assistance in all their difficulties. Some share of his popularity may also be attributed to the novelty of his opinions, or to a new theory on the causes of diseases, which he occasionally introduced into his lectures. Dr. Alison, lecturer on the *Materia Medica*, dying in the year 1760, Dr. Cullen was appointed to fill his place; the duties of which he continued to perform until the year 1766, when, in conjunction with Dr. Gregory, he was appointed lecturer on the practice of medicine in the place of Dr. Rutherford. He now resigned the chair

of chemistry to Dr. Black, who had been his pupil, and who in that line more than rivalled his teacher. The year following, Dr. Gregory dying, Dr. Cullen had the sole possession of the practical chair, which he held to within a few months of his death. This happened on the 5th of February, 1790, he being in the seventy-seventh year of his age. Though he lived to this great age, yet no deficiency was observed in his memory, or in the distinctness and clearness of his delivery. His lectures were not written, but given from short notes; they were therefore constantly varied, and the illustrations frequently entirely new. Finding his lectures on the *Materia Medica* were printing, he obtained an injunction against their being issued, until he had corrected them; and they were permitted to appear in 1772. In 1789 he gave an enlarged and improved edition of them, in two volumes, in 4to. Fearing a similar fate to his "*Lectures on the Practice of Medicine*," he published them in 1784, in four volumes 8vo., but his most esteemed work is his "*Synopsis Nosologiae Practicae*," in two volumes 8vo. It has passed through several editions. The fourth impression, published in 1785, contains his last corrections. The first volume contains the nosologies of Sauvages, Linnæus, Vogel, Sagar, and Macbride: the second his own, manifestly an improvement on those of his precursors. A small publication concerning the recovery of persons drowned, and seemingly dead, completes the works of this eminent professor. *General Biography*.

CULLEN, in *Geography*, a royal burgh in the county of Banff, Scotland. At one period this place was under the jurisdiction of an hereditary constable, which office was held by the earls of Findlater, when it was termed *Inverculan*, "from its situation at the mouth of the burn of Cullen, or Cullen, which at the north end of the town falls into the sea." The present earl of Findlater is almost sole proprietor of the town, and hereditary provost, under whom the government is administered by three bailies, a treasurer, dean of guild, and 13 counsellors. Cullen labours under two serious disadvantages, the want of a harbour, and that of water for domestic purposes; the latter is confined to one solitary spring, but the former might be obtained for the expenditure of a few hundred pounds. The exertions of an earl of the above family established a manufacture of linen and damask about 50 years past, which still flourishes, and yet the general appearance of the houses is mean, and the streets filthy. Two villages, named Cullen and Portknockies, near the town, are inhabited by fishermen, who possess 14 or 15 boats, and supply Cullen and the country plentifully with fish, besides which, they salt and dry large quantities of cod, ling, skate, and haddock, which they export in open boats to Leith, Montrose, Arbroath, and Dundee.

The soil of the parish of Cullen varies considerably; a large portion is a deep rich loam, other parts are of strong clay, and as it approaches the shore, there is a mixture of sand and gravel. The district extends about four miles southward from the sea, and is three miles in breadth; the surface generally declines towards the north and east, and Bin-hill is the only eminence entitled to the term of mountain, which is situated two miles from the sea, and one south-west of Cullen; this grand hill is 1050 feet above the level of the ocean, and has recently been planted with various species of trees to the summit; Cullen-house, the seat of the earl of Findlater, is surrounded with plantations formed about 25 years past by the earl, during which period 8000 Scots acres of land have been set with upwards of 30,000,000 of trees. The mansion stands upon a perpendicular rock 50 feet higher than the burn of Cullen, and the communication

ation with the parks and woods is formed by a handsome stone-bridge over the burn, the single arch of which is 64 feet high, and 84 in width; the nature of the surface of this domain produces the richest description of landscape; and the view from the house commands a fine circuit of country to the south; nor is that to the north, including the frith of Moray, less beautiful. The antiquities of this parish are confined to the ruins of a castle situated on an eminence close to the sea, near the town of Cullen, and those of a house where Elizabeth, queen of king Robert Bruce, is said to have died. The farms of the district are generally small, inclosed, and in a state of high cultivation, and the population amounted to 1718 in 1791. Sinclair's Statistical Account of Scotland.

CULLEN, a fair town of the county of Tipperary, Ireland; at a bog near which was found a golden crown, weighing six ounces, and many other ancient curiosities, of which an account is given in the Philosophical Survey of the South of Ireland.

CULLIAGE, or CULLAGE, a right usurped by the ancient lords, and established by a shameful custom, which gave them the first night with their vassals' brides.

The word is formed from the French *col, podex*, the breech.

It is said this right was established by Euenus III. king of Scotland, and finally abolished by Malcolm III. a compensation being settled in its stead; as occasioning frequent revolts of the vassals against their lords. See MARCHETA.

CULLION, in *Botany*. See ORCHIS.

CULLODEN, in *Geography*, a heath of Scotland, in the county of Inverness, about nine miles distant from Inverness, surrounded with hills, except on the side that lies open to the sea, and celebrated by the victory obtained in April 1746, on the part of the duke of Cumberland, over Charles Stuart, the Pretender, which completely terminated the hopes of this family and its friends. In less than half an hour after the commencement of the action, the rebels were totally routed. The French piquets, after covering the retreat of the highlanders, retired to Inverness, and surrendered themselves prisoners of war. An entire body of the rebels marched off the field in order, with their pipes playing, and the Pretender's standard displayed; the rest were defeated with great slaughter, and the field was covered with the dead and wounded. The road, as far as Inverness, was strewed with the bodies of the slain. Twelve hundred, or as some say, 3000 rebels were slain or wounded in the field and in the pursuit. The earl of Kilmarnock was taken, and in a few days lord Balmerino surrendered; and was conveyed, with other leaders of the rebellion, by sea to London, there to await their fate. The glory of this victory, in which the duke of Cumberland acquired great honour by his skill and valour as a commander, was unhappily sullied by the barbarity of the soldiers, who thirsted for revenge. It is said, that they traversed the field of battle, and massacred those miserable wretches who lay maimed and expiring. The vanquished adventurer rode off the field accompanied by a few horsemen; and having conferred with the old lord Lovat, dismissed his followers, and wandered about, a wretched and solitary fugitive, among the isles and mountains, for about four months, enduring such a variety of hardships and sufferings, as no other person ever survived. In less than an hour, his hope wholly vanished, and the rebellion was completely extinguished. When the news of this battle arrived in England, the nation was transported with joy, and extolled the duke of Cumberland as a hero and deliverer. Both houses of par-

liament congratulated his majesty on the auspicious event. They decreed, in the most solemn manner, their public thanks to his royal highness, which were transmitted to him by the respective speakers; and the commons, by bill, ad led 25,000*l. per annum* to his former revenue.

CULLITON. See COLYTON.

CULLOOR, a town of Hindoostan, in the country of Golconda; 15 miles W. of Rajamundry, and 100 E. of Hydrabad.

CULLUMPTON, or COLLUMPTON, a town of England, in the county of Devon, with a weekly market on Saturday. Here are manufactures of sagathies, ferges, and other woollen goods; 11 miles N. of Exeter, and 159 W. of London.

CULLY, or CUILLI, a small but handsome town of Switzerland, in the canton of Berne, district of Lausanne, delightfully situated on the banks of the Leman, or lake of Geneva, and remarkable for its excellent wine, which is reckoned one of the best of the famous wines *de la Vaux*. From an inscription which has been found here, in honour of Bacchus, with the epithet *Libero Patri Gouliensi*, this town is supposed to be very ancient. In 1440 Louis de la Palu, bishop of Lausanne, gave the inhabitants leave to enclose it within walls, and to surround it with ditches.

CULM, in *Botany*. See CULMUS.

CULM, in *Agriculture*, is a term sometimes applied to the haulm, trunk, or straw of such plants of the grass kinds as elevate their leaves, flowers, and fruits according to the definition of Linnæus; and in which the trunks or stems are tubular or hollow; having in many cases knots or joints distributed at suitable lengths or distances throughout their whole extent; the leaves being long, sleek, and situated either near the roots in large numbers, or proceeding singly from the different joints of the stalk, which they embrace at the base, like a sheath or glove. The haulm is most commonly garnished with leaves; sometimes, however, it is naked, or devoid of leaves, as in a few species of cypress-grasses. Most grasses have a round cylindrical stalk or stem, but in some species of cypress-grass, and others, it is triangular. The stalk is sometimes entire; that is, has no branches; sometimes branching, as in the *sebanus aculeatus* and *capensis*; and not seldom consists of a number of scales, which lie over each other like tiles. And lastly, in a few grasses the stalk is not interrupted with joints, as is the case in the greater part of them. The space contained betwixt every two knots or joints is termed by botanical writers *internodium* and *articulus culmi*. This sort of trunk often affords certain marks of distinction in discriminating the species of the plants. Thus, in some kinds the species are scarcely to be distinguished, except by the angles of the *culmus* or stalks. These, in some of the species are met with to the number of five, in others to six, and in others to still more, as ten.

CULM, or KULM, in *Geography*, a town of the grand duchy of Warsaw, which, since the peace of Tillit in 1807, belongs to the kingdom of Saxony, and formerly belonged to Prussia, was built in 1239, on an eminence near the banks of the Vistula, 90 miles S. of Dantzic. It was bequeathed by one of the ancient dukes of Mazovia to the knights of the Teutonic order. The inhabitants afterwards withdrew themselves from the dominion of the latter, and submitted to Poland. While the Teutonic knights had the sovereignty of Culm, the high tribunal of Prussia was held in this city. Hence the law of Culm was in such reputation that there were few places in Prussia where it was not received.

Culm is a large city, but thinly inhabited. It was anciently

ciently one of the Hanseatic towns, carried on an extensive trade, and contained considerable warehouses, built by English merchants. Its commerce, however, began to decline in the beginning of the fourteenth century, when Danzig rose into notice. It also suffered considerably during the wars in Poland. In the year 1457 the knights of the Teutonic order, from whom Culm had revolted, made themselves masters of it again; but in a few years after it was retaken by the Poles, who raised it to a bishopric. In 1544 Culm suffered greatly by fire. In 1678, bishop John Malachowsky attempted to repeople the town, by attracting settlers from all parts; and it is worth recording, that, though a Roman Catholic dignitary, he was sufficiently enlightened to grant the colonists the free exercise of the religious worship to which they might be attached.

The trade of Culm was once more reviving, and commencing to flourish under the dominion of Prussia, when the short war of 1806 and 1807 annihilated again its fair prospects. There was at Culm a Prussian military academy, for sixty young noblemen. Culm has five Catholic convents, and a Catholic college, which, however, is hardly deserving of that name.—Also, a hill of considerable magnitude in the midst of the Saxon village of Reichenau, in the circle of the Erzgebirge.

CULM, in *Minerology*, a variety, according to Kirwan, of the native mineral carbon, but less pure, differing from it chiefly in being more brittle, and emitting, when ignited, a disagreeable smell. Its colour is black; lustre from three to four; not easily kindled, but when ignited burns a long time without flame or smoke, does not cake, and leaves but little ashes. The specific gravity is 1.396. It seems to be the glanz-kohle of Werner. It is found in Wales. See *COAL-balls*.

CULMAIN, in *Geography*, a town of Germany, in the circle of Bavaria, and Upper Palatinate; 14 miles E. of Bayreuth.

CULMBACH, or CULEMBACH, HANS VON, in *Bio-graphy*, a painter, and an engraver on copper and on wood. He is said to have been a disciple of Jacob Wolch, and afterwards to have received instructions from Albert Durer. He died in 1545.

This artist marked his plates with J. C. or H. v. C. We shall only notice the following, which are in a dry, stiff manner:

“A Soldier armed, conversing with a female Peasant,” 1517. “The Crucifixion of our Saviour, with the Virgin and St. John, one on each side the Cross.” “St. Michael killing the Dragon,” copied from M. Schoen. Heineken.

CULMBACH, in *Geography*, a town of Germany, in the circle of Franconia, in the margraviate of Bayreuth, which, till the year 1806, belonged to Prussia. It was anciently the principal town of the margraviate, which went likewise by the same name. The town is seated on the river Mayne, near the old castle of Plaffenbourg, 27 miles S.E. of Cobourg, and 30 N.E. of Bamberg. E. long. $11^{\circ} 28'$. N. lat. $50^{\circ} 13'$.

CULMIFEROUS PLANTS, in *Agriculture*, are all such as have smooth jointed or knotted stems, and in which the seeds are enveloped or wrapped up in a sort of chaffy husks or coverings. All the grains, and most of the grasses, as well as many other plants, are of this kind.

CULMINATING POINT, in *Magnetism*. See *MAGNET*.

CULMINATION, in *Astronomy*, the transit of a star or planet over the meridian, or that point of its orbit wherein it is at its greatest altitude.

Hence, a star is said to *culminate*, when it passes the meridian.

To find the culmination of a star, or the line wherein it passes the meridian. On a meridian line A B (*Plate V. Astronomy, fig. 43.*) stretch a thread, DC, perpendicularly; and from D to E, another DE, cutting the meridian obliquely, at any angle: the triangular thread, DCE, will cut the plane of the horizon in the meridian line, or at right angles; and consequently will be in the plane of the meridian.

The eye, therefore, being so placed, as that the thread DE may cover the thread DC; wait till the star be bisected by the triangle DCE; for then the eye and the star will, together with the triangle DCE, be in the same plane; consequently the star is in the meridian.

To find the culmination of a star by the globe, see *GLOBE*.

There are few days when one or more stars do not come to the meridian with the sun, and then they have the same right ascension with him:—also, at some time of the year, the sun must have the same right ascension which any proposed star has; though at other times he may have a less, and so precedes, or comes to the meridian before that star; or a greater, and so follows that star, and comes to the meridian later. Hence is derived the following method of finding the culmination of the stars. Rule. Subtract the sun's right ascension for the proposed day, from the right ascension of the given star; the difference will be the time of the star's culmination, nearly. Then say, as 24^h is to the daily change of the sun's right ascension, so is the time of culminating, nearly, to a fourth number, which, being subtracted from the time of culminating, nearly, will give the true time of the star's culmination. If this time be less than 12^h it happens in the afternoon; but if more than 12^h , the excess above 12^h will shew the time next morning. N.B. 24^h must be added to the star's right ascension, if the sun's right ascension be greatest.

If the time of the star's culmination be wanted for any other meridian besides that of Greenwich, or London, add the longitude in time to the time of culmination nearly, if the longitude be west, or take their difference if it be east, and use that sum or difference instead of the time of culmination nearly; observing only in the latter case, that if the longitude in time be greater than the time of culminating nearly, the minutes and seconds resulting from the proportion must be added to the time of culmination nearly, instead of being subtracted from it.

To find the time of the culmination of the moon, or any planet. Mr. Keith has given the following rule in his “*Trigonometry*,” b. iii. c. 2. Take the difference between the sun's and planet's motion in right ascension in 24 hours, if the planet be progressive, or their sum, if retrograde. Then, as 24 hours diminished by this sum or difference, when the planet's motion is greater than the sun's, or increased by it when the sun's apparent motion is greater, is to 24 hours; so is the planet's right ascension at noon, diminished by the sun's, to the time of its transit. Note. If the sun's right ascension be greater than the planet's, 24 hours must be added to the planet's right ascension before you subtract.

CULMITZSCH, in *Geography*, a small town of Saxony, in the circle of Neustadt, remarkable for a rich quarry of slate in its neighbourhood.

CULMORE FORT. See *LONDONDERRY*.

CULMSEE, or CULMENSEE, a small town of the grand duchy of Warsaw, which, since the peace of Tilsit, belongs to the kingdom of Saxony. It was built in 1251, and contains the cathedral church of the bishopric of Culm.

CULMUS, in *Botany*, a Culm or Straw, is the peculiar stem

stem of the grass, corn, and reed tribe. It bears both leaves and flowers, though sometimes the former are situated only about the lower part of the Culm. There are also many rushes which have none but radical leaves; yet their stem is by analogy called a *Culmus*, and not a *Scapus*. The nature of this kind of stem is better understood than defined. It is almost always cylindrical, rarely triangular, never square. It is mostly simple, rarely branched; generally consisting of several joints or knots, but sometimes, as in rushes, uninterrupted. For the most part it is hollow, and lined with a fine brilliantly white film; sometimes it is filled with pith. Its cuticle is hard, and contains stony earth. This sort of stem is not found in any dicotyledonous plant, but only in such as have either one cotyledon, or none at all. S.

CULPABILIS. See *Non est culpabilis*.

CULPÆUS CANIS, &c. in *Zoology*, the Arctic fox, or **CANIS VULPES LAGOPUS**; which see.

CULPEPPER, NICHOLAS, in *Biography*, student, as he calls himself, in physic and astrology, was the son of a clergyman, by whom he was sent, after receiving a preparatory education, to the university of Cambridge. There making but a short stay, he was put apprentice to an apothecary, under whom he appears to have acquired a competent knowledge of the *Materia Medica*, and of the method of preparing and compounding medicines. On completing the term of his apprenticeship, he came to London, and settled in Spital Fields. This was about the year 1642. By the whole tenor of his writings we find he joined, or, at least, favoured the Puritans, and those who were engaged in those unhappy times in overturning the constitution of the country. But his warfare was with the college of physicians, whom he accused of craft and ignorance. Like the popish clergy, he says, they endeavoured to keep the people in ignorance of what might be useful either in preserving or restoring health. To counteract their endeavours, he published, in 1649, a translation of the "Dispensary of the College of Physicians," in small 4to., adding to the account of each drug and preparation a list of their supposed virtues, and of the complaints in which they were usually given. He also published an Herbal, which has passed through several editions, and is still in repute as a sort of family guide. He tells you in this book under what planet the plants are to be gathered, which he thinks essential in preserving their virtues. He intended, he says, treating of the diseases incident to men, at the different periods of their lives, and as a beginning, gave a directory to midwives, treating in it of the method of insuring a healthy progeny, and then of the management of new-born children. Though this book is of very small value, it passed through many editions. He died at his house in Spital Fields in 1654.

CULPEPPER, in *Geography*, a county of Virginia, in America, between the Blue Ridge and the Tide-Waters, which contains, by the census of 1800, 18,700 inhabitants, of whom 7348 are slaves. The court-house of this county is 45 miles from Fredericksburg, and 95 from Charlottesville.

CUL-PRIT, in *Law*, a term used by the clerk of the assize, or clerk of the arraigns, on behalf of the crown, when a person is indicted for a criminal matter.

After the indictment is read in court (which is the crown's charge against the prisoner at the bar), he is asked if guilty, or not guilty? If he answers *not guilty*, there is next a replication from the crown, by continuing the charge of guilt upon him; which is expressed by pronouncing the word *cul-prit*; *cul* being an abbreviation of the Latin word *culpa*, *guilt*, or *culpabilis*, *guilty*, and *prit* (now *pret*) the old French word for *ready*; or, as others rather think, the

Latin *apparet, appears*: or rather, *qu'il paroit*, let it appear so, *i. e.* not guilty.

From this formula, therefore, of the clerk of the arraigns, the prisoner is deemed guilty of the crime charged on him; and that the crown is ready to prove it upon him: this sense of the term *prit* being deduced from the year-books, and other ancient repositories of law.

That this is the true explanation of the term, seems evident from the form of the entry of the record of the trial, when drawn at large.

By this replication, the king and the prisoner are at issue. How our courts, says judge Blackstone, came to express a matter of this importance in so odd and obscure a manner, "*rem tantam tam negligentem*," can hardly be pronounced with certainty. It may, perhaps, however, be accounted for by supposing, that these were at first short notes, to help the memory of the clerk, and remind him what he was to reply; or else it was the short method of taking down in court, upon the minutes, the replication and averment; "*cul-prit*," which afterwards the ignorance of succeeding clerks adopted for the very words to be by them spoken. But, however it may have arisen, the joining of issue, (which, though now usually entered on the record, is no otherwise joined in any part of the proceedings) seems to be clearly the meaning of this obscure expression; which has puzzled our most ingenious etymologists, and is commonly understood as if the clerk of the arraigns, immediately on plea pleaded, had fixed an opprobrious name on the prisoner, by asking him, "*cul-prit*, how wilt thou be tried?" for, immediately upon issue joined, it is inquired of the prisoner, by what trial he will make his innocence appear. This form has, at present, reference to appeals and approvements only, wherein the appellee has his choice either to try the accusation by battle or by jury. But upon indictments, since the abolition of ordeal, there can be no other trial but by jury, *per pais*, or by the country; and, therefore, if the prisoner refuses to put himself upon the inquest in the usual form, that is, to answer that he will be tried by God and the country, if a commoner; and if a peer, by God and his peers; the indictment, if in treason, is taken *pro confesso*; and the prisoner, in cases of felony, is adjudged to stand mute, and if he perseveres in his obstinacy, shall now be convicted of the felony. Stat. 12 Geo. III. c. 20. When the prisoner has thus put himself upon his trial, the clerk answers in the humane language of the law, which always hopes that the party's innocence, rather than his guilt, may appear, "God send thee a good deliverance."

CULROSS, in *Geography*, a royal borough and seaport, in the county of Perth, Scotland, is situated on the north shore of the Frith of Forth, whence it appears to great advantage, elevated on an abrupt ascent. The town consists of two streets, intersecting each other at right angles. It received its charter from James VI. in 1588, and is still in possession of all the original privileges granted by that royal act. James IV. and Charles II. granted the inhabitants the exclusive privilege of making *girdles* of iron, an utensil used in Scotland for baking unleavened bread; but the girdles cast at Carron having superseded them, the town has evidently declined; nor has their hitherto considerable trade in salt and coals been more successful lately than was an attempt to extract tar, naphtha, and volatile salt, from pit-coal, commenced by the earl of Dundonald, who expended large sums in erecting works for this purpose at Culross. The harbour is perfectly safe; but several sunk rocks obstruct the entrance, and thus prevent the admission of ships of considerable burden, though the spring tides rise about sixteen feet.

The parish of Culrofs is nearly four miles square; and, except the sudden ascent from the shore, may be pronounced almost level. The fourth portion of the soil is in a state of excellent cultivation; but the north is little more than a vast marsh, susceptible of no other improvement than planting. Part of the district abounds with iron ores and iron-stone, free-stone of superior quality, and coals: and at Kincardine, four miles from Culrofs, fish are caught to the amount of 1000*l.* per annum, by *cruives*, an invention calculated to facilitate the labours of the fisherman. The monastery of Culrofs, situated above the town, was founded by Malcolm, thane of Fife, in 1217, who dedicated it to the Virgin Mary and St. Servanus, and endowed it for an abbot and nine monks of the Cistercian order. Near the ancient abbey church is the magnificent seat of Culrofs, erected about 1590, by Edward lord Kinlofs, and now the property of the earl of Dundonald; besides which, the parish contains an elegant mansion, named Valley-field, the residence of sir Charles Preston, and the vestiges of two Danish camps. The population was 1442 in 1792.

CULTELLATION, a term which some authors use for the measuring of heights and distances by piecemeal; that is, by instruments which give us such heights and distances by parts, and not all at one operation.

CULTIVATION, in *Agriculture*, the art of tilling, preparing, and improving the soil by means of labour and manure, or other similar methods, so as to render it in a fit condition for affording plentiful crops, of different kinds, at suitable periods, according to the nature of the climate, situation, and other circumstances in which it is placed. It is the art of bringing Land into such a state of texture and confidence, as that the roots of cultivated vegetables may be permitted to spread and extend themselves in the most proper manner for deriving their nourishment from it; and that water and other matters necessary for the perfect growth, vegetation, and support of such plants as crops, may be contained and preserved in it in the most favourable manner for these purposes.

This is a business of course, which consists of different divisions or distinctions, in respect to its nature, as,

1. Tillage, in all its different branches.
2. Manuring, or the application of composts, and other substances.
3. Weeding, or the removal of all sorts of noxious plants.
4. Managing grafts-plants, or grafts husbandry.

The proper management, in regard to all these, and some other circumstances, constitute what may be termed cultivation, or field husbandry. See **TILLAGE** and **HUSBANDRY**.

CULTIVATOR, a name given to an implement, somewhat of the horse-hoe kind, invented for the more convenient and effectual sowing of the earth or mould. (See **HORSE-HOE DRAG**, **EXTIRPATOR**, &c.) The implements of this kind, which are employed in agriculture, are constructed in very different ways, according to the nature and circumstances of the land, and the particular crops and uses for which they are designed. In *Plate X. on Agriculture*, *fig. 1*, there is the representation of one, which is made upon a very simple plan, and which is recommended by the writer of the Agricultural Survey of the County of Nottingham. The dimensions of which are these: from *a* to *b*, the length of the first bull, 4 feet 6 inches. From *c* to *d*, the length of the second bull, 3 feet 9 inches. From *a* to *e* 16 inches; the teeth 2 feet long, and bent near the bottom, for the share part to lie flat on the earth, and placed one foot from each other. From *e* to *f*, the length of the beam is 6 feet. From *g* to *h*, the length of the iron axle-tree for the small wheels, 1 foot 6 inches. From *i* to *k*, the

length of the iron that shifts through the beam, and fastens with a screw at *l*, 2 feet.

The great advantage in this tool is, that the teeth are so placed, that they intersect each other; and being only twelve inches apart, by thus intersecting, the distance is reduced to six inches; and from the breadth of the share being full three inches, the intermediate space is further reduced, so that the distance is ultimately so small, that the whole of the ground must be perfectly broken down and reduced into a fine state of mould, in consequence of which, the purpose of ploughing is not only answered, but that of harrowing likewise, without the roots of the quick-grass being cut in two; which is a benefit that cannot be obtained by ploughing. And from the teeth standing in a forward direction, and bending in that way, they likewise bring up all the roots to the surface of the land, which is another important point that cannot be gained by the plough. And there is a considerable abridgement of labour with this tool, which is another circumstance of great consequence to the farmer; as with four horses and one man, from six to seven acres are capable of being worked over in the course of a day, especially where the soil is of a sandy quality. And at *fig. 2*, is shewn a *corn cultivator*, which is employed in Essex, where the grain is sown at narrow intervals, by Mr. Rogers, and other farmers, as stated in a survey of that district, by Mr. Young. The handles from Cook's machine are capable of being attached to it. The dimensions are as below:

		Feet.	Inches.
From <i>a</i> to <i>b</i>	- -	4	7
<i>c</i> to <i>d</i>	- -	4	7
<i>c</i> to <i>a</i>	- -	0	9
<i>d</i> to <i>f</i>	- -	0	9
<i>a</i> to <i>e</i>	- -	0	10
<i>e</i> to <i>g</i>	- -	0	5
<i>g</i> to <i>h</i>	- -	0	4

This is found a very useful and convenient implement in these cases, for working between the narrow rows of white corn-crops.

Fig. 3, exhibits the representation of a *bean cultivator*, which is made use of by the same farmer at Ardleigh, and which is found in practice to be a most excellent tool.

The dimensions of it are these:

		Feet.	Inches.
From <i>a</i> to <i>b</i>	- -	4	0
<i>a</i> to <i>c</i>	- -	1	3
<i>b</i> to <i>d</i>	- -	1	3
<i>c</i> to <i>f</i>	- -	1	0
<i>f</i> to <i>g</i>	- -	0	5
<i>g</i> to <i>h</i>	- -	1	0
<i>h</i> to <i>i</i>	- -	0	5

And at *fig. 4*, is exhibited a *double cultivator*, which is found useful on the farm of C. C. Western, esq. in the same county.

The dimensions of this are as below:

		Feet.	Inches.
From <i>a</i> to <i>b</i>	- -	6	0
<i>c</i> to <i>d</i>	- -	1	10
<i>b</i> to <i>h</i>	- -	1	9
<i>e</i> to <i>b</i>	- -	6	0
<i>f</i> to <i>h</i>	- -	1	2
<i>f</i> to <i>g</i>	- -	0	11
Diameter of wheels	- -	2	1

This is a very powerful and effective implement, and dispatches much work with facility.

An improved implement of this sort is likewise shewn at *fig. 5*, which is found of great utility in preparing and bringing

stiff heavy soils into a fine state of mould. It is well calculated for this purpose, from the weight which it possesses, and its great length of coulters. In this tool *a, b, c, d*, are the beams or buils in which the shares or coulters are placed, and which have a sort of triangular form; *d, d, d*, the three wheels, which are capable of being raised or depressed, and *e, e*, the handles.

Implements of this kind are also sometimes constructed of a compound description, so as to operate, with certain additions, in respect to shares, as *scarifiers* and *scufflers*; and, when complete, as a cultivator. Mr. Cook is the inventor of an useful tool of this nature. See SCARIFIER and SCUFFLER.

CULTRARIUS. See POPÆ.

CULTURE, in *Agriculture*, the art of tilling, improving, or bettering the condition of lands, by such practices as are the most adapted to their peculiar nature and qualities, whether under the systems of grain or grass husbandry.

CULTURE, *Row*, is that mode of cultivation in which the crops are sown or set in rows or drills, at certain distances, by means of the hand or machinery. See DRILL-HUSBANDRY, and DRILL.

CULVER, in *Rural Economy*, a name provincially given in some districts to the pigeon.

CULVER-HOUSE, a name sometimes applied to signify a pigeon-house, or dove-cot.

CULVERINE, a piece of artillery longer than ordinary cannon of the same caliber. Its length is generally about ten feet six inches. The famous culverine of Nancy is 22 feet long, and throws a bullet of 18 lb. They do not make use of this piece, as it does not throw a ball so far as cannon of the same bore. It is at Dunkirk. See CANNON. Hence a soldier of militia in the 15th century, was called by the French *coulevrenier*. He wore an habergeon, or small coat of mail, or armour with sleeves, a gorgerin, or neck-piece, and a head-piece, and brass placard before, with a dagger and cutting-sword.

CULVERT, an arched drain for the passage of water; these occur very frequently under roads, and still more so under navigable canals, for conveying rills and brooks of water from the upper to the lower side of the road or canal, and even for discharging the rain water out of hollows on the upper side of a canal. When such a drain or arch under a canal sinks down in the middle, in order to clear the bottom of the canal, it is said to be "broken-backed." Under the article CANAL we have treated pretty fully on the construction of culverts, and have only here further to add some remarks on the culverts for large canals, like the Inverness and Fort William, or Caledonian Canal, where it is difficult for the engineer in a short space of time to ascertain the size of culverts for some ravines, sufficient for discharging their flood waters, and not be liable to choak by timber and other matters hurried down some of the streams from mountainous districts, and where it is often advisable to construct two arches, in such glens as are deep enough to admit of it, the larger of which may serve for a road-arch, or communication under the canal, at all times but during great floods, by which the inconvenience and expence of bridges over the canal may be saved, in many instances. At Bannvie, a culvert, or aqueduct, as the same are called when they exceed a certain size, under canals, was finished under the Caledonian Canal, in the spring of 1806, by Mr. Thomas Telford, consisting of two arches 9 feet wide, and 10 feet high each, their bottoms being paved with stones on edge, to serve for the passage of carts, cattle, &c., which otherwise must have had a pair of swing bridges over this large canal, which is too wide to admit of one bridge

to turn or swing across it. We lately had occasion to notice some places on the upper side of the Grand Junction Canal, in Buckinghamshire, where the culverts are made so small that sudden rains have been known to inundate one or more houses, while bushes, straw, and other matters are always liable to choak up or diminish the water-way, so as to endanger the lives of the inhabitants, were such to happen in the night of a rainy season.

CULVERTAIL, in *Ship Building*, is used for a manner of letting one timber into another, so that they cannot slip asunder. The fastenings of a ship's *carlings* into the beam is so performed. See DOVE-TAIL.

CUMA, in *Geography*, a town of the island of Gdolo, situated at the bottom of a large bay.—Also, a small island in the Mediterranean, near the coast of Italy; five miles west of Naples. See CUMÆ.

CUMÆ, in *Ancient Geography*, *Cuma*, or *Cyme*, an ancient city of Italy, in the Campania, west of Naples, and north of Baiæ, situated near the sea, on a lofty rock or hill, which afforded a beautiful and extensive prospect, and a proper place for the foundation of a citadel. It is said to have been founded in times of remote antiquity by two colonies of Greeks; one of which migrated from a city of the same name in Æolia, and another from Chalcis in Eubœa; and both of them accustomed to maritime occupations, sailed in pursuit of discoveries into the Mediterranean, and established themselves on the coast of Italy. These two colonies, after some previous adventures, settled on the same spot, and determined to share in common the honour and advantage of the situation in which they were established. Accordingly, the Cumæans gave their name to the new city, and the Chalcidians gave theirs to the inhabitants, so that the city of Cumæ was inhabited by Chalcidians. This colony, in process of time, became very powerful, and extended itself along the coast of Naples. The first establishment of the Cumæans was at a place called "Dicearchia," which was adapted to the accommodation of their vessels; and it afterwards took the name of Puteoli or Puzzuoli. The Cumæans soon perceived that they had not chosen the most favourable spot for a permanent and flourishing settlement; the gulf of Naples presented a more commodious and desirable situation; but as their capital had been consecrated to the gods, and the lares had possession of their houses, they thought it impicthy to abandon it. However, they built a second town at the bottom of the gulf, and this they called "New Cumæ," or *Νεαπολις Κομαίων*. Such was the origin of the name, and of the town of Naples. The Cumæans made also another establishment at Baiæ. Cumæ, founded as we have related by Greek emigrants, became the seat of commerce, the parent of Naples, and the capital of a state that ruled the seas before either Rome or Carthage were heard of. Its prosperity was of long duration, while the power of infant Rome was confined within the narrow limits of her own plain. Under the sway of Aristodemus, Cumæ afforded an asylum to Tarquin the Proud, the deposed king of Rome, whom all the neighbouring potentates had in vain attempted to assist, and had refused to relieve. This harbinger of a banished prince had attained the height of power by subverting the liberties of his country. In the 64th Olympiad, about the 524th year B. C., the Tyrrenians attacked Cumæ, in hopes of plundering her rich stores, the fruits of long and prosperous traffic, but were driven off with loss; in this emergency, the republic owed its safety to the courage and conduct of Aristodemus, and rewarded his services with every token of honour which a free state could bestow. He soon became so popular a leader, as to excite the jealousy of the senate; with a view to his destruction, they sent him with a very small force to defend

defend the city of Anicia against the Tuscans; but by the exertion of great military talents, Aristodemus terminated the campaign gloriously, and when he returned to Cumæ, availed himself of the attachment of the troops for destroying his enemies, and usurping the sovereign authority. He reigned many years with despotic authority, but at length, as it has happened to many other tyrants, was betrayed by his own creatures, and, with his whole family, put to the sword. As Rome advanced in her fortunate career, the glory of all the neighbouring powers faded away before her; the Cumæans, in their turn, submitted to her yoke, and were treated with lenity; but real liberty was gone, and trade abandoned their shores; at length, the dullness and solitude of the place grew so profound, as to become proverbial: "vacuæ Cumæ," "Quieta Cyme, &c." Indeed, the Cumæi were noted for their stupidity. "Cumæ is stupid to a proverb," says Strabo, (lib. 13.); and he assigns these reasons for it. *First* of all; they were 300 years before they thought of laying a duty on merchandise imported into their harbours, and before they found that they inhabited a maritime city. *Secondly*. Having mortgaged their porticoes for a certain sum of money, and failing to pay it at the time stipulated in the contract, their creditors would not allow them to walk under them; but, when the rains began to fall, those creditors, being touched with compassion, caused it to be published, that the Cumæans might, if they pleased, take shelter under their own porticoes: which gave occasion to this railery: "The Cumæans had not the sense to know that they had a right to stand under their own porticoes when it rained, till they were informed of it by the voice of the crier." Cumæ was farther reduced to a lower state by the Goths; and at last, being a mere receptacle for thieves, it was, in the year 1207, totally ruined and forsaken. The rocky hill upon which the citadel of Cumæ stood, is the produce of an eruption, and hollowed into many spacious caverns, amongst which we now look in vain for the grotto where the "Cumæan sibyl" (see *SIBYL*) pronounced her oracles; this sanctuary was undermined and destroyed in the Gothic war. Agathias informs us that it served as a foundation for one of the principal towers of the fortrefs. When Narfes invested the citadel, he caused this rocky cover to be cut through in several directions, and then propped up with beams; when every thing was ready for the assault, the wood was set on fire. As soon as the proppes were consumed, the rocks gave way, and the walls fell with them into the temple; and on these accumulated ruins the imperial troops entered the breach. If antiquarians may be credited, the cave which was the abode of the Cumæan sibyl, extends three Italian miles in length, to the lake Avernus, where it has another entrance; but in several parts the passages have been ruined; and at the entrance near Cuma, it is not possible to advance above 200 paces. This part of it is cut out of a rock, and is of considerable height and breadth. Some years ago, the imperial general Wenzel caused an aperture with 51 steps to be cut in the side of the cave, for the convenience of coming out of it; but the peasants have since stopped it up.

Cumæ extended across the plain towards the east, where many ruins are still to be seen. A large brick arch, called "l'Arco Felice," thrown across a chasm in the ridge that bounds the plain on the east side, is supposed to have been a gate of the city, or a passage under a Roman aqueduct, and not a monument of the ancient Cumæan republic. In Lucan's time, about A. D. 62, Cumæ appears to have been a very populous city, from the following passage:

"——— Acidalia quæ condidit Alite muros
Euboicam referens fecunda Neapolis urbem."

"Where the fam'd walls of fruitful Naples lie,
That may for multitudes with Cumæ vie."

The adjacent country still retains a luxuriant fertility, especially towards "Torre di Patria," where it produces abundance of fig-trees.

CUMÆ, a town of Asia, in Æolia, the largest and most beautiful in this province, according to Strabo. Some have said that Homer, and also Ephorus, were of this city. It was episcopal, as we learn from the acts of the council of Ephesus, held in the year 431.

CUMAMUS, in the *Materia Medica*, a name given by many of the ancients to CUBEBES.

CUMANA, in *Geography*, a province of the government of Caracas in South America, including also Barcelona, which, however, has never formed a distinct province, but being included in the grant to the Wallees, was esteemed a part of Venezuela. The town of Barcelona was founded in 1634, on a plain, one league from the mouth of the river Neveri. The population is computed at 14,000; but the town is disagreeable, and is only noted for feeding swine. The population of the province of Cumana amounts, according to Depons, to 80,000.

The town of Cumana is the most ancient in the Caracas, having been founded in the year 1520, on a sandy soil, about a league from the sea. The heat of the climate is very great; nevertheless the population is computed at 24,000, and is thought to be on the increase. It is, however, subject to frequent earthquakes, which Humboldt supposes to proceed from the volcanoes of Cumucuta, which force out sulphur and hot-water. The caverns of Chuchenaro emit an inflammable gas, which shines in the night, especially after rains, to the height of 100 fathoms. The population of Cumana is composed chiefly of Creoles, who are industrious, and fond of their native place. The great article of trade is salted fish, which is sent to Caracas and the windward islands; the industrious inhabitants being from Catalonia, and the Canaries. Cumana is difficult of access, and might present a defence of about 5000 men. N. lat. 10° 12'. W. long. 66° 40'.

CUMANA, *New*, or *New Andalusia*. See *Spanish GUIANA*.

CUMANAGATE, a small town in a bay on the coast of Terra Firma, in the province of Cumana; situated on a low flat shore, which abounds with pearl oysters.

CUMANCHES, a tribe of warlike Indians, who every year enter the province of New Mexico, to the number of about 1500 men. Their country is unknown, as they always march prepared for war, which they carry on against all the other tribes. They encamp in tents made of the skins of buffaloes, and which are carried on the backs of large dogs trained for that purpose. The men are only clothed down to the navel, and the women to their knees. When they have concluded the traffic which brings them to this province, consisting in the skins of wild goats and buffaloes, and little children, whom they have made captives, for they kill the men and women, they withdraw till another year.

CUMANDA GUACU, in *Botany*, a name for certain very large Indian kidney-beans, which roasted, confused, and exhibited with an egg, are given for fluxes of the belly; boiled, made into a cataplasm, and applied to the belly, they are said to cure colic pains; and they are in this form applied to apostemations, with a view of resolving them.

CUMANIA, or COMANIA, in *Ancient Geography*, *Kizlar-Kalesi*, a fortrefs situated on an elevated rock, before the Caucasian gates according to Pliny. He says that it was provided

provided with a good garrison, for defending the passage which led to an immense number of barbarians, who inhabited the regions on the other side of Caucasus.

CUMARCA, in *Ichthyology*, a species of *Stromateus*; which see.

CUMARUNA, in *Botany*, Aubl. Guian. Pl. 296. Lam. Ill. Pl. 601. Class and order, *diadelphia decandria*.

Gen. Ch. *Cal.* Perianth top-shaped, one-leaved, three-toothed. *Cor.* Petals five, two lower ones shorter. *Stam.* Filaments ten, nine united at the base. *Ferac.* Legume, with a single seed.

Sp. C. A tree. *Leaves* alternate, pinnated; leaflets few, alternate, egg-shaped, veined. *Flowers* in a terminal panicle. A native of Guiana.

CUMBACH, in *Geography*, a small town of Germany, in the Principality of Saxe-Gotha, remarkable for a fish-pond of 120 acres, which yields excellent carp and eels.

CUMBER, a port town of the county of Down, Ireland, situated on a branch of the lake of Strangford. It has a very fine strand near it, and a race course two miles in circuit. It is 8½ Irish miles N. of Dublin, and about 9 S. E. from Belfast.

CUMBERLAND, RICHARD, in *Biography*, an English bishop of considerable celebrity, was born in London in the year 1632; he received his classical learning at St. Paul's school, whence, about the year 1640, he was removed to Magdalen College, Cambridge. Here he took his degrees, and pursued his studies with a view to the practice of medicine. Physic, however, he soon relinquished for the study of theology; and being elected fellow of the college, he took orders, and obtained the rectory of Brampton, in Northamptonshire, where he continued in the zealous discharge of the duties attached to his office, till the year 1667, when he came to London, and was chosen chaplain to sir Orlando Bridgman, then chancellor, who shortly after presented him with the living of Allhallows, in Stamford. In this situation he devoted himself as well to the immediate duties of his profession, as to philosophical studies. In 1672 he published a treatise, in quarto, entitled, "De Legibus Naturæ Disquisitio Philosophica, &c." This work, which was intended as a refutation of the tenets of Hobbes, obtained for its author a high degree of reputation. It has been twice translated into English, with additions. In 1680 he took his doctor's degree; and in 1686 he published, "An Essay towards the Recovery of the Jewish Weights and Measures, comprehending their Monies, by Help of an ancient Standard, compared with ours of England, &c." Dr. Cumberland was always attached to the doctrines of the church of England; and on account of his zeal in defence of the principles of the revolution, he was selected as a fit person to fill the see of Peterborough. To this high honour he was appointed without any solicitation, and solely on account of his learning, virtues, and zeal; he is said even not to have known the fact, till he read an account of it in the public newspapers. In 1691 he entered upon the duties of the episcopal office, which he performed for many years with the greatest assiduity. He died in the year 1718, of a paralytic stroke, in his 87th year. His life had been active, and his various pursuits required deep study and intense thinking; but his faculties were strong till almost the last period of his mortal existence. So great was the vigour of his mind, that, at the age of 84, when bishop Wilkins presented him with a copy of his Coptic Testament, he set about studying the language, and made so rapid a progress in it, that he was able to read the greater part of the version with the most critical attention. After the death of bishop Cumberland, his son-in-law, Mr. Payne, published "Sai-

choniatho's Phœnician History, translated from the first Book of Eusebius, de Preparatione Evangelica, &c." upon which the venerable prelate had bestowed much time and research; and in the course of the inquiry he was led to other subjects, an account of which he left behind him in MS., which was published by the same editor, under the title of "Origines Gentium Antiquissimæ, or, Attempts for discovering the Times of the first Planting of Nations." The character of this learned prelate was highly esteemed by his contemporaries; his principles were moderate; and he was candid towards those whose sentiments did not correspond with his own. His manners were unassuming, condescending, and affable; and his piety was the result of excellent habits formed in early life. He was hospitable without ostentation; and by his example, as well as by his advice, he did every thing in his power to render the clergy in his diocese respectable, useful, and happy. *Biog. Brit.*

CUMBERLAND, in *Geography*, a maritime county in the northern part of England, bordering Scotland, is bounded on the west by the Irish Sea, into which its western coast projects, somewhat in the form of a bow, to an extent of nearly 70 miles; on the north it is separated from Scotland by Solway Frith, the Scots Dyke, and the river Liddal; its eastern side is skirted by the counties of Northumberland and Durham, the dividing limits being mostly artificial; to the south its boundaries are Westmoreland and Lancashire: from the former it is partly separated by Uils-water and the river Eamont, and from the latter by the river Uddon. The greatest extent of the county is about 80 miles, but its mean length not more than 60; its general breadth is nearly 35; and its circumference 224. It contains 970,000 acres: of these 342,000 comprise the mountainous districts; 470,000 are enclosed, and chiefly under cultivation; 150,000 are in low commons, capable of improvement; and 8000 in lakes and waters. Cumberland is divided into five wards, synonymous with the hundreds in other counties; but so called here, from the inhabitants of each division being formerly obliged to keep watch or ward against the irruptions of the Scots, in times of warfare. It contains one city, Carlisle, 17 market-towns, 112 parishes, 22,445 houses, and 117,230 inhabitants. The ward of Alledale, above Darwent, is in the diocese of Chester; all the other part of the county in that of Carlisle. The representatives in parliament are six, *viz.* two for the county, two for Carlisle, and two for Cockermouth. Cumberland pays one part of the land-tax, and provides 200 men for the militia.

The surface of the county is extremely irregular and broken. The south-western district exhibits a gigantic combination of lofty, rugged, and rocky mountains, promiscuously thrown together, but enclosing many beautiful, though narrow, vallies, as well as fine lakes, rivers, and some extensive woodlands. On the eastern confines, another range of hills stretches along to Scotland, but possesses much less picturesque beauty than the former. In the front of this last assemblage, a considerably broad tract of low ground extends the whole length, unobstructed by any high mounts, partly cultivated, partly heathy common, and watered by the Eden, and numerous brooks and rivulets. This tract becomes very extensive before it reaches Carlisle; stretching across the county to Wigton, and thence towards Workington, including all the northern part of the county. Along the western shore there is a strip of cultivated land, from two to four or five miles in width. The woodlands are but few; and the general appearance of the county is bleak and naked, from the extensive moors which so frequently present themselves to the eye of the traveller. The soils of this district are exceedingly various, but have been classed under the divisions of sterile clays, or strong rich loams, which occupy

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but a small portion of the county, and are chiefly appropriated to the growth of wheat; dry loams, including the different degrees from the rich brown loams to the light sandy soils, and occupying the greater portion of the land; wet loam, generally on a clay bottom, and adapted to grazing; and black peat-earth, which is very prevalent in the mountainous districts, and particularly those adjoining Northumberland and Durham. The enclosed grounds are kept free from moles by an excellent practice observed in the different parishes, of hiring persons to destroy them for a term of years, at a certain annual salary, which is raised like the regular parochial taxes, and does not exceed an halfpenny *per* acre.

The buildings of this county are chiefly of stone, except in the market-towns, where the houses are generally of brick; and near the borders of Scotland, where they are mostly constructed with clay or mud. Most of the old farm-houses, cottages, and out-houses, are thatched with straw, and the stones of the walls laid with clay instead of mortar; but the more modern buildings are generally covered with slate, and their walls cemented with lime: in those districts, however, where clay or mud walls prevail, the advances of modern improvements are admitted with some reluctance; the people considering them as an expensive and unnecessary luxury. Many of the houses are covered with a very fine blue slate, the best kinds of which are procured in Borrowdale.

The principal manufactures of Cumberland are the spinning and weaving of cotton into calicoes, corderoys, and other articles; and the printing of cotton. The former has not been many years introduced: it was first planted at Dalton, and soon extended to Carlisle, Warwick-Bridge, Corby, Comersdale, and a few more places. The seat of cotton-printing is at Carlisle, the population of which place has thereby been much increased. In some of the market-towns are small manufactories of checks and coarse linens. At Egremont eighteen looms are employed in the manufacture of sail-cloth; and at Whitehaven, where it was only introduced in 1786, several hundred hands are employed in the different branches of the same manufacture. Three or four paper-mills are employed in different parts of the county; a manufactory of coarse earthen ware has been long carried on near Dearham; and near Workington are the Seaton iron-works, which employ several hundred workmen. Many private families knit and spin their own stockings; and every village is supplied with a weaver or two, who weave their home-made cloth.

The mineralogical substances of Cumberland are extremely rich and variegated, and exist in such abundance in the different parts of the county, that a description of the whole would, of itself, constitute a work of considerable magnitude. In the calcareous genus is limestone, of various colours, texture, and hardness. The quarries at Overend contain impressions of many kinds of shells, with ammoniæ, entrochi, and allerix; and a great variety of marine exuvix are found in the limestone on the moors near Gilsand Spa. Mathe, with shells in it, of a brownish colour, is met with at Little Stainton and Dacre; dusky-green, veined with white, at Crof-fell; yellowish, grey, lead-colour, and brown, with or without shells, on the banks of the Peteril; and blueish-black, clouded with lead-grey, veined and spotted with white, hard, free from cracks, and admitting of a fine polish, near Kirkofwald. Beautiful specimens of spar of various colours, amorphous, and crystallized in different forms, are found in the lead mines of Aldifton-Moor; and, since the study of mineralogy has become fashionable, have been sold for considerable sums. In the mines between

Keswick and Aldifton it has been met with, crystallized in hexagonal prisms, terminated at one end by a pyramid. Gypsum is found in many parts of the county: its colour is mostly white, veined, clouded, and spotted with red; sometimes brown and grey; of compact, even fracture. It frequently, however, exhibits a considerable variety of appearance, even in the same quarry; and at Newbiggen is met with not only compact, but splintery, fibrous, foliated, and crystallized: in the latter state, the crystals are pure and colourless, arrow-headed, and irregularly disposed, forming the resemblance of a cock's-comb. It lies embedded in red argillaceous marl, between two large strata of sandstone: the upper, solid, hard, and fine-grained; the under, loose, friable, and coarse. The stratum varies considerably in thickness; and in some places, immediately below it, there is a thin bed of a soft umber-like substance, which, on examination, appears to be decayed wood. The lead-mines of Aldifton-Moor contain a great variety of fluors, compact, foliated, amorphous, and crystallized. The colours are red, green, blue, yellow, purple, violet; and of all gradations, from very pale to almost black. They are sometimes found studded with brilliant quartz crystals, and with crystallized galena. In the magnesian genus is mica, which is found of many different colours, interspersed and incorporated with several kinds of stones, and particularly in most of the sandstone rocks. Spangles of silvery mica are met with in a red, slaty, friable stone, near the river Caldew, in the quarries on the Peteril, and various other places. The steatites, semi-indurated, white, streaked with pale green, has been found at Hill-Top and St. John's; and some of the solid white kind in Langnor iron-mine, at Borrowdale, and at one or two other places. Some small rounded masses of serpentine are met with in many parts on the sea-shore, and sometimes, but rarely, in ploughed grounds. Asbestos has been discovered in the lead mine at Northend, and in some of the mountains, where it presents a great variety of appearance, as it seems to graduate into different substances.

Of the silicious genus are quartz crystals, which are found in the mines of Aldifton-Moor, beautifully transparent, and of various forms and colours: some of the yellow kind are but little inferior in brilliancy to the Brazilian topaz. Garnets are not unfrequently found in micaceous stones; and some beautiful small ones have been met with in the neighbourhood of Keswick. Cornelians of various tints, but principally of different shades of red, are often discovered on the sea-shore, and near the surface of the earth in many other places. Jaspers of different colours, often veined, clouded, and spotted, are generally met with in beds of rivers, and on or near the surface of the ground. Many substances of the argillaceous genus are found in different parts of the county. Trap, whinstone, and toadstone, exist almost every where; the two latter generally in detached pieces on the surface. Schistus, of several varieties of colour, is found in immense strata in many parts; and schistose clay, frequently of a tabulated structure, resembling the leaves of a book, is met with in most coal-mines, at Gilsand, Keswick, and various other places. Terra-porecellanea, or porcelain clay, the kaolin of the Chinese, is found at Barrock, near Nebbles: it is of a white and cream colour, mostly friable, and dusty; it contains minute particles of shining silvery mica. On the banks of Uilswater, tripoli is frequently discovered in rounded lumps, of a greenish colour, in gravel beds sometimes, and in coarse martial clays. Fossil, or pit-coal, is found in many parts of the county, and of very different qualities. It is met with at various places along the eastern mountains; but is easiest of access, and in the greatest abundance, on Talkin and Tindale Fells, whence Carlisle, Penrith, and

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Brampton are chiefly supplied. On the west side of the river Caldew, near Calbeck, and thence to Maryport, Workington, and Whitehaven, it exists in great abundance; and many coal-mines are constantly at work in this district, and particularly at Whitehaven. Some very large pits have also been opened at Workington and Tindale Fell, near Brampton. Thin layers of jet are sometimes found in the rocks on the Irthing, in small detached pieces in the bed of that river, on the sea-shore, and near the surface of the earth in other places. Wallerius, and other eminent chemists, have supposed it to be asphaltum, condensed and hardened by length of time. It bears a fine polish; and is frequently worked into toys, bracelets, boxes, buttons, and other articles. The famous black-lead, or wadd mines, are situated at the head of Borrowdale, in a place extremely difficult of access, and, for the riches and qualities of the substance, are unequalled by any in the world. The mines lie to the east of a very steep mountain, which forms the west side of the vale of Stomathwaite. There are two workings: the lower one is about 340 yards above the level of the sea, and its perpendicular depth about 105 yards; the upper one is nearly 390 yards above the sea, and its depth about 30. The strata of the mountain are very irregular, and broken; and the black-lead appears to have been formed in the fissures. The mineral itself does not exist in regular strata, but is found in irregular masses. It is described as lying in the mine in form resembling a tree, having a body or root, and veins or branches spreading from it in different directions: the root or body is the finest black-lead, and the branches the worst; growing proportionally more inferior, as they become distant from the parent stem. The veins, or branches, sometimes shoot out to the surface of the ground; yet these indications are very rare. The black-lead is generally embedded in a blue rock, which is not unfrequently stained as black as the mineral itself to the depth of two or three feet; sometimes there is a wet sludge between the rock and the black-lead; at others it is found in lumps, or lumps, in a body without branches. In the deepest mine, the black-lead lies in two veins, crossing each other; the main body, and richest in quality, being at the point of intersection: these veins fall perpendicularly to the depth of 40 fathoms. The blue stone, where the black-lead is commonly found, has often a stratum of hard granite above it. Quartz crystals are frequently discovered in the working. The country in the immediate vicinity of the wadd mines has been described by a native of Cumberland (Mr. George Smith), as full of cataracts and rivers, that are precipitated from the crags with an alarming noise; and the summit of the mountain itself, in whose bowels this valuable mineral is produced, has been depicted by the same gentleman as truly terrifying. "Not a herb was to be seen but wild savine, growing in the interstices of the naked rocks; while the horrid projection of vast promontories, the vicinity of the clouds, the thunder of the explosions in the slate quarries, the distance of the plain below, and the mountains heaped on mountains that were piled around us, desolate and waste, like the ruins of a world which we had survived, excited such ideas of horror as are not to be expressed." The value of this substance, and the singular fraud of an owner of a contiguous part of the mountain, who secretly sunk a shaft, and opened a passage diagonally to the mine, occasioned an act of parliament to be made in the reign of George II. to prevent its being stolen, by subjecting the criminal to the same punishment as for felony. In this act there is a recital, that black-lead hath been discovered in one mountain or ridge of hills only in this kingdom; and that "it hath been found, by experience, to be necessary in the casting of

bomb-shells, round-shot, and cannon-balls." The chief use to which it is now applied is drawing; and the lead of some pencils made at Kefwick is of so very fine a texture, that it bears a point nearly as sharp as that of a needle. Some assert that it may be used medicinally, to ease the pains of the gravel, stone, strangury, and colic.

The principal metallic substances of Cumberland are lead, copper, and iron ores. The lead mines are chiefly in Aldston-Moor, on the south-east borders of the county, where about 1100 men are employed, and clear to the owners upwards of 16,000*l.* per annum. In working some of these mines, the miners frequently meet with large breaks in the rock, like grottoes, wholly encrusted with the most beautiful spar, which, on entering, has the richest appearance imaginable. The whole cavern, by the light of a candle, reflected from a thousand points, appears as if bespangled with gold, silver, and diamonds. These internal openings are generally closed up as soon as found; the spar they contain being a great temptation to the workmen to neglect the service of their employers, as they could obtain more by gathering and selling spar than by their own business. Galena is found, in a lit varieties, in the mines in the vicinity of Aldston, Kefwick, and Caldbeck; and it not unfrequently contains a considerable portion of silver. The lead ores, in the mines of Aldston-Moor, are found lying in cracks or fissures. These fissures, though commonly nearly perpendicular, are never wholly so; and in whatever direction they are found, they always incline downwards from that side where the strata are highest: thus, in a vein from north to south, if the strata should be raised higher on the south side the fissure than on the north side, its inclination will then be from the south downwards to the north. The copper ores are commonly combined with sulphur, and generally contain both iron and arsenic. The most considerable copper-mines are near Caldbeck, at Heskett New-Market in Borrowdale, and at Newlands in the neighbourhood of Kefwick, where the celebrated mine of goldscarp is situated; from which, by the old workings, and written documents, it appears that immense quantities of copper have formerly been obtained. Specimens of copper ores have been found in the mountains named Hard-knot and Wrynose, and at some other places. Ochreous iron ores, resembling those called by Mr. Kirwan highland argillaceous ores, are very commonly met with either on or near the surface, in most parts of the county, especially in moory soils, and where the under-stratum is a coarse martial clay. They appear to have been deposited by water, as they are generally found concreted with small stones, roots, and other substances. In the parish of Egremont, at a place called Crowgarth, is the most singular mine of iron ore supposed to be in Great Britain. It lies in the earth, at the depth of 12 fathoms; and the thickness of the band of ore, which is hard solid metal, is between 24 and 25 feet. It was never known to be much wrought till the years 1784 and 1785, when it was more generally opened; and so great has been the demand for it, at Carron foundery in Scotland, and some other places, that, in 1791 and 1792, the annual exportation was 20,000 tons and upwards. At Langnor, between Whitehaven and Egremont, many varieties of the hæmatites are found, and sometimes, from their colour and shape, are called kidney ore. Native Prussian blue is sometimes found in the peat-moss of this county, and in clay, particularly that of Etterby-scar, near Carlisle; its qualities, however, are different from the artificial.

Among the semi-metals, blende, pseudo-galena, or black-jack, is met with in the greatest plenty. Its forms and colours are very different: some is bluish, resembling galena; black,

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black, or greenish-black, like pitch; of a glassy shining surface, often crystallized, in irregular pyramids, and other irregular figures; sometimes containing silver, arsenic, and other substances. Oxyd of zinc has been found at Borrowdale and Ousley. A mine of cobalt was discovered about ten years since, in the parish of Croftwaite, near Cowdale, about four miles from Keswick; but has hitherto been little regarded. Antimony has been found at Bassenthwaite; and in the stratum under the coal at Tindale Fell, oxyd of manganese, tinged and intermixed with pyrites and mica: it has also been discovered at Caldbeck.

This county abounds with lakes, some of which will be hereafter described under LAKE. The principal are known by the names of Ulls-water, which occupies an area of about 9 miles in its greatest length, by about three quarters of a mile, on an average breadth; Thirlmere, or Leathes-water, a narrow irregular sheet of water, about 3 miles in length, skirts the immense base of Helvellyn; Derwent-water, or Keswick lake, is rather of an oval figure, and extends nearly 3 miles in length, and about half so much in breadth; Bassenthwaite-water, or Broad-water, which is nearly 3 miles north of Keswick lake, abounds with beautiful scenery, and is 4 miles long, and 1 in its greatest breadth; Over-water, in a barren situation between Binsey and Caldbeck-fells, is about half a mile in length, and in breadth somewhat more than a quarter of a mile; Lowes-water, beautifully situated near the north-western extremity of the mountains above Mellbreak, is about a mile long, and a quarter broad, and, contrary to all the others, discharges its waters at the southern end; Crummock-water expands its pellucid bosom beneath some lofty mountains, and extends nearly 4 miles in length, and half a mile in breadth; Buttermere-water, about a mile south of Crummock-water, from which it is separated by a luxuriant vale, is about a mile and half long, and half a mile broad, into which numerous torrents pour down from the mountains, one of the roaring cataracts falling between four and five hundred yards; Ennerdale-water spreads among the mountains near to Whitehaven, and guarded, on every side but the west, with craggy and almost impassible heights, possesses a space of about 2 miles and half in length, its greatest breadth being about three quarters of a mile; Wait water expands its crystal surface in the bosom of Walsdale, to the length of 3 miles, and breadth, in the widest part, of three quarters of a mile; Burn-moortarn, seated among the widest mountains at the head of Miterdale, covers about 250 acres; Deveck-water occupies about 300 acres, amongst the hills south-east of Ravenglass; Talkin-tarn and Tindale-tarn possess about 40 or 50 acres each, on the moors south-east of Brampton; and Turn-wadling spreads its waters over 100 acres, on a barren common, 1 mile west from the river Eden, at Armathwaite.

The mountains of Cumberland are exceedingly numerous, and many of them of immense elevation, and singular structure. They enter into the composition of almost every view; and either by their sublime heights, their romantic forms, the dignified grandeur of their aspects, the immensity of the rocky masses that compose them, or the wild, awful, and imposing majesty of their appearance, are well calculated to give birth to interesting emotions.

The rivers and smaller streams of this county are very numerous. The principal are the Eden, the Eamont, the Duddon, the Ehen, the Derwent, the Great, the Cocker, the Ellen, the Waver, the Wampool, the Caldew, the Petril, the Esk, the Liddal, the Line or Laven, the Ithling, and the Gelt. Hutchinson's History of the County of Cumberland, 2 vols, 4to. Houteman's Topographical Description of Cumberland, &c. 8vo.

CUMBERLAND, a county of America, in New Brunswick, comprehending the lands at the head of the bay of Fundy, on the basin called Chebecton, and the rivers that flow into it. It has several townships; three of which are settled are Cumberland, Sackville, Amherst, Hillsborough, and Hopewell. It is watered by the rivers Aulac, Missiquash, Napan, Macon, Memramcook, Petcodia, Chepodie, and Herbert; the three first of which are navigable, for three or four miles, for vessels of five tons; the Herbert is navigable to its head, 12 miles, in boats; the Napan and Macon are shoal rivers; the others are navigable four or five miles. The town of Cumberland has coal-mines.

CUMBERLAND, a county in the district of Maine, E. of York county, and has the Atlantic ocean on the S., and Canada on the N. Its sea-coast, formed into numerous bays, and skirted with many fruitful islands, is nearly 40 miles in extent in a straight line. Saco river, which runs south-easterly into the ocean, separates between this county and York on the S.W. Cumberland is divided into 33 townships; its capital is Portland; and the number of its inhabitants, by the census of 1800, is 37,918. The soil of this county, as well as that of York, is, to a great extent, light and lean; great part being pine-plains.

CUMBERLAND, a county in New Jersey, bounded S. by Delaware bay, N. by the county of Gloucester, S.E. by cape May, and W. by the county of Salem. It is divided into seven townships, of which Fairfield and Greenwich are the chief: it contains 9529 inhabitants, 75 of whom are slaves.

CUMBERLAND, a county of Pennsylvania, bounded N. and N.W. by Mifflin, E. and N.E. by Susquehanna river, which separates it from Dauphin, S. by York, and S.W. by Franklin county; 47 miles in length, 42 in breadth, and containing 18 townships, of which Carlisle is the principal. This county is generally mountainous; but between N. and S. mountain, on each side of Conedogwinet creek, there is an extensive, rich, and well-cultivated valley. It contains 25,386 inhabitants, of whom 228 are slaves.

CUMBERLAND, a county in Virginia, on the N. side of Appamatox river, which divides it from Prince Edward; 25 miles long, 15 broad, and containing 9839 inhabitants, of whom 5711 are slaves.

CUMBERLAND, a county of N. Carolina, in Fayette district, containing 7608 inhabitants, of whom 2097 are slaves. In this county is a township of the same name.

CUMBERLAND, a county of Kentucky, containing 3284 inhabitants, of whom 236 are slaves.

CUMBERLAND, the north-eastermost township of Providence county, in the state of Rhode island, containing 2056 inhabitants.

CUMBERLAND, two towns of Green county, in the state of Pennsylvania, containing 1277 inhabitants.—Also, a township in York county, Pennsylvania.—Also, a township of Washington county, in the same state.—Also, a township of Adams's county, in the same state, containing 1263 inhabitants.—Also, a township of the same state, in the county of Bedford.

CUMBERLAND, a post town, and the chief township of Alleghany county, in Maryland, lying on the N. bank of a bend of Potowmack river, and on both sides of the mouth of Wilt's creek. It contains about 100 houses, a court-house, gaol, market-house, and three churches, one for Roman Catholics, one for Methodists, and one for German Lutherans.

CUMBERLAND Bay, a bay on the west coast of the island of St. Vincent. N. lat. 13° 12'. W. long. 61° 18'.—Also, a bay on the N.E. coast of the island of Juan Fernandez.—

Also,

Aifo, a large bay, so named by captain Cook, in January, 1775, in the S. Atlantic ocean, near the coast of the isle of Georgia, a few miles E. of Possession bay, in S. lat. $54^{\circ} 5'$. W. long. $37^{\circ} 18'$.—Also, a bay in the most northern part of America, opening under the polar circle, running to the N.W. and W., and supposed to communicate with Baffin's bay on the N. N. lat. $66^{\circ} 44'$. W. long. $65^{\circ} 20'$.—Also, a harbour on the E. side of Washington's isles, on the N.W. coast of N. America; S. of Shitkifs, and N. of Cummahtwan.—Also, a harbour on the S.E. coast of the island of Cuba, reckoned to be one of the finest in the West Indies, capable of sheltering any number of ships; 20 leagues E. from St. Jago de Cuba. N. lat. $20^{\circ} 3'$. W. long. $76^{\circ} 50'$.

CUMBERLAND, *Cape*, a cape on the island of Espirito Santo, one of the New Hebrides, in the S. Pacific ocean. S. lat. $14^{\circ} 39'$. E. long. $166^{\circ} 47'$.—Also, a cape on Kerguelen's land, $1\frac{1}{2}$ league S.E. $\frac{1}{2}$ S. from Christmas harbour.

CUMBERLAND *Fort*, a fort of the United States of America, in New Brunswick, situated at the head of the bay of Fundy, on the E. side of its northern branch. It is capable of accommodating 300 men.—Also, a fort which formerly stood in Cumberland township, in Alleghany county, Maryland, at the W. side of the mouth of Will's creek.

CUMBERLAND *Fort*, a strong place at the S.E. point of Portsea island, in Hampshire, commanding the entrance into Langstone harbour. In the government trigonometrical survey, in 1793, the west chimney of the governor's house in this fort was observed from Butser hill, distant 70,049 feet, and Rook's hill, distant 74,863 feet; whence is deduced its latitude $50^{\circ} 47' 21''$. 7 N., and longitude $1^{\circ} 1' 43''$, or 4^m . $6'.9$ W. of Greenwich.

CUMBERLAND *Gap*, a place having a post-office, in Claiborne county, and state of Tennessee; 528 miles W. from Washington.

CUMBERLAND *House*, a factory belonging to the Hudson bay Company, situated in New South Wales, in North America, on the S. side of Pine island lake. N. lat. $53^{\circ} 56' 41''$. W. long. $102^{\circ} 13'$.

CUMBERLAND *Island*, an island on the coast of Camden county, in the state of Georgia, between Prince William's sound at the S. end and the mouth of Great Satilla river at its N. end, and 20 miles S. of the town of Frederica. It is about 20 miles in circumference. N. lat. 31° . W. long. $81^{\circ} 40'$.—Also, an island in the South Pacific ocean, so called by captain Wallis in June, 1777, lying low, and about the size of queen Charlotte's island, or 6 miles long, and 1 wide. S. lat. $19^{\circ} 18'$. W. long. $140^{\circ} 36'$. Variation of the needle $7^{\circ} 10'$ E.

CUMBERLAND *Islands*, a cluster of islands near the N.E. coast of New Holland, so called by Cook in June, 1770, forming a passage, called, from the day of its discovery, "Whitunday passage." S. lat. $20^{\circ} 36'$. W. long. $211^{\circ} 28'$.

CUMBERLAND *Mountain*, a mountain of N. America, occupying a part of the uninhabited country of the state of Tennessee, between the districts of Washington and Hamilton and Mero district, and between the two first-named districts and the state of Kentucky; the north-easterly part of the ridge being the dividing line between Kentucky and Virginia. The ridge is generally about 30 miles broad, and extends from Crow creek on Tennessee river from S.W. to N.E. In Tennessee it enlarges in width to 50 miles, and with a surface so level, that it may be called the high lands.

On both sides of the mountain is found limestone. The mountain consists of the most stupendous piles of craggy rocks of any mountain in the western country. It is inaccessible for miles, in some parts, even to the Indians on foot. In one place, near the summit, it has a very remarkable ledge of rocks, about 30 miles long, and 200 feet thick, presenting to the S.E. a perpendicular face. Morfe.

CUMBERLAND *River*, a river of N. America, called by the Indians "Shawanee," and by the French "Shavanon," which falls into the Ohio, 10 miles above the mouth of Tennessee river, and about 24 miles due E. from fort Maffac. It is navigable for large vessels to Nashville in Tennessee, and from thence to the mouth of Obed's or Obas river. The chief branches, some of which are navigable to a great distance, are the Caney fork, 100 yards wide, joining it 120 miles above Nashville, Harpeth, Stones, Red, and Obed's. The head waters of this river are separated by the Cumberland mountains from those of Clinch river. Its course, till it comes to the fourth line of Kentucky, is S.W., then westerly, in general, through Lincoln county; thence S.W. into the state of Tennessee, where it encloses, by its windings, Sumner, Davidson, and Tennessee counties; it then takes a north-westerly direction, and re-enters the state of Kentucky, and from thence preserves nearly a uniform distance from Tennessee river to its mouth, where it is 300 yards wide. It is navigable without interruption for more than 500 miles. In passing through Mero district, it meanders form several peninsulas, 14 or 15 miles round, and about one across the isthmus. Maife.

CUMBERLAND *River*, a place so called, where a post-office is kept, in Tennessee; 13 miles from Cumberland mountain, and 81 from the Crab orchard in Kentucky.

CUMBERLAND *Township*, a township in Upper Canada, lying partly in the county of Stormont, and partly in Dundas, and being the sixth township on ascending the Ottawa river.

CUMBRAY, GREAT and LITTLE, islands of Scotland; the former is about 6 miles in circuit, and lies at the mouth of the river Clyde, between the isle of Bute and the county of Air; the latter is smaller, and about half a mile from the former.

CUMBU, or COOMBOO GOOMBAW, a large and populous city, in the route from Lassa in Thibet to Pekin in China, where is situated, near a small river, a spacious and celebrated putala, or temple of public worship, (Buddhala, the mansion of Buddha.) When the Lama of Thibet, at the earnest solicitation of the Chinese emperor, determined to pay him a visit, he began his journey from Tifolumbu in July, 1779; in 46 days he reached Duchu, or Doochoo, seated on the banks of a river of the same name, where a messenger from the emperor met him, and presented to him pearls, silks, and many other valuable articles, with a rich palanquin; after a journey of 21 days more, he arrived at Thuchiar, or Thooktharing, receiving in his progress every possible token of respect and homage. Here he was met by eight persons of distinction, and 2000 troops, who were commissioned by the emperor to attend him; but the lama, having received their presents of gold, silver, horses, mules, silks, &c. dismissed them; and proceeded thence to Cambu, to the temple of which many thousand devout persons annually resort. Here he was detained four months, on account of a great fall of snow; and during his stay he received from the emperor costly presents of pearls, a curious watch, snuff-box, and knife all ornamented with jewels, besides many curious brocades and silks. At this place, and in other stages of his journey, he was importuned by all ranks

ranks of people for a *mark of his hand*, which, being coloured with saffron, he impressed on clean paper. Many thousands of these were printed, dispersed among the people, and preserved as the most sacred relics. At this place he was again presented, by the emperor's orders, with a very rich palanquin, a large tent, 20 horses, several mules, &c: the whole amounting in value to upwards of 25,000 illeungs; an illeung of silver being worth about 7s. After several months the lama pursued his journey, followed by a very numerous train of attendants, receiving costly presents in every stage of his progress, and at length was introduced with singular parade to the emperor's presence; who expressed a wish to be instructed in the mysteries of his religion. After an intercourse of some months, the lama sickened of the small-pox and died; nor was less attention paid to his corpse than to his person whilst he lived. It was deposited in a temple of gold; and the emperor distributed silver on the occasion, to the amount of four lacks of rupees, to the devout persons who attended and offered prayers over the corpse. Another lack of rupees was distributed before the corpse was removed, in order to be carried in the temple of gold, enclosed within another of copper, into his own country. After a tedious journey of more than seven months, they arrived at Digurlee, or Teshoo Loomboo, the place of the lama's residence, whilst he lived. Here his remains were deposited in a most superb pagoda, or monument, built for that purpose; and the two temples of gold and copper, brought from Pekin, were carefully fitted up, and set up in the pagoda, immediately over the spot where the corpse was laid. Turner's Emb. to Tibet, Appendix.

CUMELE, and CUMELBOTANE, in *Botany*, the name by which the Greek writers have described the *lupulus* or hop.

CUMERIUM PROMONTORIUM, in *Ancient Geography*, a promontory of Italy, which advanced into the Adriatic sea, to the north of Aniona, and near it.

CUMI, a town of Ethiopia, situated, according to Pliny, on the banks of the Nile.

CUMIANA, in *Geography*, a town of France, in the department of the Pô in Piedmont in Italy, which formerly belonged to Sardinia. It is the chief place of a canton, in the district of Pignerol, with a population of 4507 individuals. The canton has 8 communes, and 9050 inhabitants.

CUMIERES, a small town of France, on the river Marne, in the department of the Marne; 3 miles N.W. of Epernay; famous for its excellent champagne wine.

CUMILLUM MAGNUM, in *Ancient Geography*, a place of Italy, marked in the Itinerary of Antonine on the route from Rimini to Dertona, supposed to be the present *Ci-gomol*.

CUMIN, in *Botany*. See CUMINUM.

CUMIN, *Baslard*. See LAGOECIA.

CUMINIODES, Tourn. See LAGOECIA.

CUMINUM, (Heb. כִּמְוִן , Isaiah xxviii. 25. 27. כִּמְוִן , Sept. Diosc. *Cymium*; Plin.) Linn. Gen. 351. Schreb. 483. Willd. 547. Gært. 126. Juss. 221. Vent. 3. 19. Clus and order, *pentandria digynia*. Nat. Ord. *Umbellatae*, Linn. *Umbelliferae*, Juss.

Gen. Ch. Universal and partial umbels four or five-rayed, uniform. Leaves of the general involucre three or four, capillary or trifid, at least as long as the umbel; of the partial one, three or four, bristle-shaped, as long as the rays of the partial umbel. *Cal. proper* superior, very small, five-toothed. *Cor.* Petals five, emarginate, inflexed, somewhat

unequal. *Stam.* Filaments five; anthers simple. *Pist.* Germ inferior, larger than the flower, oval-oblong; styles two, very small; stigmas simple. *Fruit* oval-oblong, striated. *Seeds* two, convex on one side, flat on the other.

Ess. Ch. Fruit oval-oblong, striated. Partial umbels about four. Involucre three or four-leaved.

Sp. *C. cyminum*. Cumin. Linn. Sp. Pl. Mart. Lam. Willd. Gært. tab 23. Lam. Ill. Pl. 194. Woodv. Med. Bot. tab. 191. (*C. femine longiore*; Bauh. Pin. 146. Moris. Hist. 279. § 9. tab. 2. 1. *C. fativum*; Cam. Epit. 518. Rai. Hist. 433.) *Root* annual, white, oblong, slender. *Stem* six or seven inches high, smooth, striated, leafy, branched. *Leaves* alternate, rather distant, finely cut like those of anise or fennel; segments few, almost capillary, about an inch long, generally bitenate, the two lateral ones often simply bifid. *Flowers* small, white or purplish; three or four, seldom five in each partial umbel. *Fruit* aromatic, crowned with the minute teeth of the calyx, terminated by the short reflexed styles. *Seeds* with nine shallow filiform furrows on the convex side, smooth or slightly hispid. A native of Egypt and Syria. It is cultivated for sale in Sicily and Malta, whence the rest of Europe is supplied with the seeds. They have an aromatic, warm, and bitterish taste, with a strong, but not disagreeable, smell; contain a large quantity of essential oil, and are supposed to possess a carminative and stomachic power, equal, if not superior, to most of those of the umbelliferous plants. The Dutch are said to put them into their cheese, and the Germans into their bread. In Malta the plant is called *cumino aigro*, or hot cumin, to distinguish it from anise, which they call *cumino dolee*, or sweet cumin.

CUMINUM *femine rotundiore* & *minore*; C. Bauh. See PIMPINELLA *anisum* β .

CUMINUM *sylvestre, capitulis globosis*; C. Bauh. See LAGOECIA.

CUMINUM *sylvestre, siliquatum pone*; Dalch. See HYPECOCUM *creatum*.

CUMMASBAWAS, or CUMMASBAAWAA, in *Geography*, a sound and village on the E. side of Washington island, on the N.W. coast of North America. The port is capacious and safe; and its mouth lies in N. lat $53^{\circ} 2' 30''$, and W. long. $228^{\circ} 22'$. At this port the women take the precedence of the men in every point, and particularly in their commercial concerns.

CUMMINGTON, a township of America, in the state of Massachusetts and county of Hampshire, lying about 20 miles N.W. of Northampton, and containing 985 inhabitants.

CUMNER, or CUMNAR, a vicarage in Berkshire, in the hundred of Horner. On the hill in this parish, which is near to Oxford, a station was chosen in the government trigonometrical survey in 1799, about 130 feet W. of the centre of the clump of trees; the situation of which was determined by an observation from Shotover hill, distant 29,231.5 feet; and bearing $76^{\circ} 58' 3''$ N.E. from the parallel to the meridian of Dunnose; and another from Whitebrin hill, distant 14,714.3 feet; whence is deduced its latitude $51^{\circ} 44' 2''.4$ N., and longitude $1^{\circ} 18' 18''.4$, or $5^m 13^s.2$ W. of Greenwich. This station was used with Shotover station, for settling the place of Oxford observatory, in connection with this survey.

CUMPETES, in the *Materia Medica*, a name given by some of the Greek writers to the *carpesia* of Galen and others. This was an aromatic drug, and was the younger shoots and tender twigs of an odoriferous tree, growing on some mountains in Pamphyha, which were collected in the spring,

spring, and, when dried, were used as a succedaneum for the cinnamon. The word *cumpetes* often occurs in Myrcellus; but there is some doubt in the orthography, whether it be *cumpetes* or *cumpetes*: there seems most reason to believe the latter is the proper word. Charito mentions this drug in his antidotes; and the commentators usually explain it by the word *carpesia* or *carpasus*, a name by which they understood, though improperly, the cubebs. The Greeks of the later ages, and the Latin writers who succeeded them, all fell into the same error, of calling the *carpesia* the cubeb; though the accounts of the ancient Greeks are against it. Nay, Avicenna seems to have given into the same error; for he has transcribed into his chapter of cubebs what Galen says of the *carpesia*.

CUMPULUNGO, in *Geography*, a town of Walachia; 56 miles N.N.W. of Bucharest.

CUMSTWITH LEAD-MINE, in Cardiganshire in Wales, was worked by the mine adventurers of England, about the year 1700. It was famous for its bellies of ore, from 4 to 7 yards broad, from 10 to 30 yards long, and from 4 to 7 yards high, with sometimes only a leader of an inch thick between these, for 5 or 10 yards together, both in sinking and driving: in some places the ore was found interwoven, as it were, with the substance of the rock.

CUN, or CUNNING, at sea. See COND.

CUNAXA, in *Ancient Geography*, a place of Asia, in Assyria, situated on the left bank of the Euphrates, and at the distance of five stadia from Babylon, where the combat took place between Cyrus and Artaxerxes.

CUNCULIANA, an episcopal town of Africa, in the Byzacene territory.

CUNDIER, JACQUES, in *Biography*, a French painter and engraver, who flourished at the commencement of the 17th century. He engraved the portraits of the first presidents of Aix in Provence; a book in folio, 1624; as well as other prints from different matters. Heineken.

CUNEGES, in *Geography*, a small town of France, in the department of the Dordogne, chief place of a canton, in the district of Bergerac. It has but 407, but the canton contains 9252 inhabitants, in 18 communes, upon a territorial extent of 197½ kilometres.

CUNEGO, DOMENICO, in *Biography*, an engraver of considerable eminence, who was born at Verona in the year 1727. At first he studied painting in the school of Francesco Ferrari, but afterwards entirely renounced the pallet for the graver. Many of the finest prints in that beautiful selection, entitled, the Scuola Italica, published at Rome by the late Mr. Gavin Hamilton, are by the hand of this master. At an advanced period of life, Cunego formed a design of publishing the entire work of Michael Angelo, in the Sistine chapel; and though the encouragement he met with was not sufficient to enable him to complete so noble an undertaking, we are indebted to him for transcripts of several parts of that chapel, which were never previously engraved, independent of prints in outline, upon a small scale, of the entire work. Domenico had two sons, Aloysio, born in 1757, and Joseph, born in 1760, who both practised the art of engraving, with a success, however, very unlike that of their father.

CUNEI, in *Ancient Geography*, a people of Spain, who are supposed to have inhabited a district called *Cuneus*, corresponding to the kingdom of Algarve.

CUNEL, in *Conchology*. There are several fossil shells which authors refer to this genus, whose species have no existence among the known recent shells. Da Costa has figured one of these, *Tab. 6. fig. 5.* which is most cautiously

fluffed. Other fossil cunei are reticulated, and some fulcated, &c.

CUNEI, in *Natural History*, a name given to those *telline*, which have one side of their shell much more extended than the other. See MUSCLE.

CUNEIFORM LEAF, in *Botany*. See LEAF.

CUNEIFORME, in *Anatomy*, a name given to several bones. The sphenoid bone is often mentioned by that name. There is an os cuneiforme in the first phalanx of the carpus; and there are three ossa cuneiformia in the tarsus. See SKELETON.

CUNELIONE, in *Ancient Geography*, a town of Albion, situated, according to the Itinerary of Antonine, between Verulacione and Spinæ; now Marlborough, Wiltshire.

CUNETTE, in *Fortification*. See CUVETTE.

CUNEUS, in *Ancient Geography*, a country of Spain, in Lusitania, since called the kingdom of Algarve.—Also, a promontory of Spain, in Lusitania, now Cabo di Santa Maria.

CUNEUS, one of the mechanical powers; more usually, by English writers, called the WEDGE; which see.

CUNEUS, among the Romans, a term often used to signify that part of the theatre where the spectators sat, on account of its resembling the figure of a wedge.

This term is often found in the descriptions of the ancient theatres and amphitheatres, and is thus explained. The seats being disposed circularly, were divided at regular distances by flights of steps, which gave access to them, and to the vomitoria, or doors of entrance. These stair-cases being directed to the centre of the circle, divided the seats into sections of the shape of a wedge, cuneus, from which circumstance they were named.

CUNEUS, the wedge, was also a form of battle frequent among the Romans. See WEDGE.

CUNEUS, *Parabolic*. See PARABOLIC *Cuneus*.

CUNGI, CONGI, or CUGNI, BATISTA, in *Biography*, of Borgo S. Sepolcro, a painter of the 16th century. He assisted Giorgio Vasari, in company with Cristoforo Gherrardi, in his works in the refectory of S. Michel in Bosco, at Bologna.

There was also a Francesco Cungi living at the same time, who was probably the brother of Batista. Vasari.

CUNGI, CONGI, or CUGNI, LIONARDO, a painter, native of Borgo S. Sepolcro, who flourished in the 16th century. Vasari describes him as a most excellent designer; and informs us, that he drew the whole of the Last Judgment of Michael Angelo with such intelligence, that Pierino del Vaga was induced to purchase it at a considerable price, and preserved it with great care during the remainder of his life. Vasari.

CUNI, in *Ancient Geography*, a place of Asia, in Gedrosia, according to Ptolemy.

CUNICI, a town of the largest of the Balearic islands, which, according to Pliny, enjoyed the same privileges with those of Latium.

CUNICULARIÆ INSULÆ, islands of the Mediterranean, placed by Pliny between the islands of Corfica and Sardinia. They are mere rocks.

CUNICULUS, in *Zoology*, a species of animals of the *lepus* or hare-kind, called in English rabbit. See LEPUS *Cuniculus*.

For several other species of *Cuniculus*, see CAVIA, MUS, and DIPUS.

CUNICULUS, in *Mining*, a term used by authors, in distinction from *puteus*, to express the several sorts of passages and cuts in these subterranean works. The *cuniculi* are those direct

direct passages in mines, where they walk on horizontally; but the *pulei* are the perpendicular cuts or descents.

It is an observation with our miners, that the damps so much dreaded in all mines, happen generally in the horizontal cuts; but Dr. Brown, in his examination of the gold and silver mines in Hungary, observes, that they as often happen there in the *pulei* or *scachts*, as in the *cuniculi* or *stollen*. Another observation as to damps with us is, that they are most frequent in clayey and soft places under ground; but in those mines they are as frequent where the matter is hard stone; and one of the most mischievous that had then lately happened, was in a place every way surrounded with stone so hard, that the tools of the miners could scarce work through it; and the descent had, in the very spot where the damp was, been made by means of gun-powder. In some of the *cuniculi* in these mines, there are damps that regularly return on certain occasions; as if the lower end of the *cuniculus* be filled up with water, certain parts in going to it are always affected with damps, which will put out a lamp or candle the moment it enters them, and often do great mischief to the miners in passing them. Phil. Transf. No. 48. See DAMP.

CUNILA, in Botany. (Plin. *κωνίδα*; Nicand.) Linn. gen. 35. Schreb. 46. Willd. 59. Lam. Ill. 47. Juss. 111. Vent. 2. 328. Clafs and order, *diandria monogynia*. Nat. Ord. *Verticillatae*. Linn. *Labiatae*, Juss.

Gen. Ch. Cal. Perianth one-leaved, cylindrical, striated, with five somewhat unequal teeth, permanent. Cor. One-petalled, ringent; upper lip erect, flat, emarginate; lower lip three-parted; segments rounded; middle one emarginate. Stam. Filaments two fertile, two without anthers; anthers roundish, didymous. Pist. Germ superior, four-parted; style filiform; stigma bifid, acute. Peric. The calyx closed at the throat with shaggy hairs. Seeds four, egg-shaped, minute.

Ess. Ch. Calyx five-toothed, corolla ringent; upper lip erect, flat. Two of the filaments barren. Seeds four.

Sp. 1. *C. mariaria*. Linn. Sp. 1. Mart. 1. Lam. 1. Willd. 3. (*Satureia origanoides*; Linn. Sp. Pl. Ed. 1. *Thymus tolus ovatis acuminatis serratis*; Gron. Virgin. 04. *Calamintha mariana*; Pink. Mant. 35. tab. 344. fig. 1. *C. erecta virginiana*; Morif. Hist. 3. 413. § 11. tab. 19. fig. 7.) "Leaves egg shaped, serrated; corymbs terminal dichotomous." Root perennial. Stems about a foot high, erect, slender, almost woody, obtusely quadrangular, smooth, branched. Leaves opposite, sessile, acute. Flowers small. The whole plant has an aromatic taste and smell, exactly resembling pennyroyal. There is a variety almost scentless, with narrower leaves, and smaller heads. A native of Maryland and Virginia. 2. *C. pulegioides*. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Ill. Pl. Willd. 4. (*Melissa pulegioides*; Linn. Sp. Pl. Ed. 1. *M. floribus verticillatis*; Gron. Virgin. 167. Kalm. It. 2. 314. Eng. Ed. 1. 592.) "Leaves oblong, two-toothed; flowers in whorls." Root annual. Stems seven or eight inches high, erect, pubescent, branched. Leaves opposite, toothed, smooth above, roughish with very short hairs underneath, on short petioles. Flowers in axillary whorls, shorter than the leaves continued from the upper to the lower pair of leaves; two lower divisions of the calyx bristle-shaped, ciliated. A native of North America. It has a strong scent, and an infusion of it is said by Kalm to be used by persons who have taken cold and have a pain in their limbs. 3. *C. thymoides*. Linn. Sp. Pl. 3. Mart. 3. Lam. 3. Willd. 5. (*Thymus pulegioides*. Linn. Sp. Pl. Ed. 1. *Acinos thymifolus & facie*; Morif. Hist. 3. 404. § 11. tab. 19. hg. 6. *Calamintha minima*,

thymi folio; Tourn. 194.) "Leaves oval, quite entire, flowers in whorls; stem quadrangular." The habit of the preceding. Stem six or seven inches high, erect; branches few, simple, short. Leaves obtuse, smooth, striated underneath. Whorls from the top to the bottom of the stem. A native of the south of France, about Montpellier. 4. *C. capitata*. Linn. Fil. Supp. 87. Mart. 4. Lam. 4. Willd. 1. "Leaves egg-shaped; flowers terminal; umbel roundish." Stem five or six inches high. Leaves somewhat oblong, smooth. Flowers purple; calyx smooth, striated; anthers black. Obs. Von Biberstein is of opinion that this is no other than *Ziziphora clinopoides* of the Species Plantarum. See Annals of Botany, vol. ii. p. 405. 5. *C. fruticoso*. Willd. 2. (*C. frutescens*; Donn. Cat. Cambrig. 5. "Leaves linear, revolute at the margin, tomentous underneath; flowers axillary; stem shrubby. A plant of dubious genus; with the habit of rosemary. Flowers large. A native of New Holland.

CUNILA *Bubula*, a name by which Pliny, and some other authors, have called the wild marjoram or origanum.

CUNILAGO, is used by some authors for the *corymb*.

CUNINA, or CUNIA, in Mythology, a goddess who had the care of little children, attending the cradle, and watching them while they were asleep.

CUNINGHAM, FRANCIS, in Biography, a painter, born in Scotland in the 18th century. He studied at Rome under Antonio Mengs, and afterwards travelled into Spain, France, Russia, and Prussia. He resided at Berlin in 1788. He seems to have been principally employed as a portrait painter. From his pictures are engraved, amongst others, enumerated by Heineken, the following portraits; Frederic II. king of Prussia embracing two levettes, a whole length, by D. Cunego; Frederic William II., a whole length, by the same; Frederic duke of York, by Townley; Catherine II. empress of Russia, by the same. Heineken.

CUNINGHAM, WILLIAM, a physician and engraver, who resided at Norwich in the middle of the 16th century. In 1559 he published a work entitled "A Cosmographical Glass," for which he engraved with his own hand several plates, and amongst the rest a large map of Norwich. Walpole.

CUNINGHAM, in Geography, a district of Scotland, in the county of Ayr.

CUNIO, DANIELLO, in Biography, a Milanese painter of the 15th century, who was the scholar of Bernardino Campi, and executed many works with the cartoons of his master, in the state of Milan. This artist, in company with Girolamo del Leone, painted in the palace of prince Triubri, at Maléo, the most celebrated enterprises of the emperor Charles V. He is likewise said to have distinguished himself in landscape. Orlandi.

CUNIO, RIDOLFO, a painter in Milan, probably a brother or near relation of Daniello Cunio. He was the scholar of Gio. Batista Crespi called Il Cerano; and amongst other public works at Milan, painted the picture of S. Antonio in the church of S. Marcelino. His cabinet pictures, in which he introduced conflagrations or nocturnal effects, are much esteemed. He was living about 1650, Orlandi.

UNION-CHARION, in Ancient Geography, a promontory placed by Ptolemy in the S.E. part of the island of Sardinia.

CUNISTORGIS, in Ancient Geography, a large town of Spain, in Lusitania, situated in the country of the people called *Cunet*, according to Appian.

CUNITZ, in Geography, a small town of Germany, in the

the principality of Saxe-Weimar, with 348 inhabitants, on an eminence near an ancient castle, from the ruins of which there is a most delightful view.

CUNLHAT, a small town of France, in the department of Puy-de-Dôme, chief place of a canton, in the district of Ambert, with a population of 2825 individuals. The canton has four communes, and 8810 inhabitants, upon a territorial extent of 107½ kilometres.

CUNNERSDORF, a small town of Saxony, in Upper Lusatia, five miles from Görlitz, with a beautiful castle, and quarries of very fine chalk stone, famous for its excellent police.

CUNNINGHAM, ALEXANDER, in *Biography*, was son of the parish minister of Etrick, near Selkirk in Scotland. Little is known of him till his appointment as tutor to the sons of the earl of Hyndford, and to lord Lorne afterwards John duke of Argyll. He was often consulted on political subjects, and was a zealous advocate for whig principles. In the reign of George I. he was appointed resident minister at Venice, where he remained from 1715 to 1720. From this period he was probably engaged in literary pursuits. The time of his death, like that of his birth, has never been exactly ascertained, though the former is supposed to have happened about the year 1737. He left behind him "A History of Great Britain, from the revolution to the accession of George I.," written in Latin, which was translated by Dr. Hollingherry, and published by Dr. Thomson in two volumes 4to. in the year 1787. This work is spoken of as possessing much original matter, and containing many facts which had never before been brought to the light. *Biog. Brit.*

CUNNINGHAM, WILLIAM, practised medicine at Norwich from 1556 to 1559, and afterwards in London, where we find him giving lectures in anatomy at the Barber-Surgeon's-hall, in 1563. He was author of "Speculum Cosmographiæ five de principiis Navigationis," lib. v. London, 1559, fol. and 4to. Two letters between W. C. and John Hall, chirurgeon, touching the cure of the pox, 1565. MS. Bodl. A new almanack and prognostication, calculated for the longitude of London, for the year 1556, Lond. 8vo. An invective epistle in defence of astrology, quoted in William Fulke's invective against astrologers.

Gale, in his Institution of a chirurgeon, makes mention of a work written by Cunningham, and intended for publication on the venereal disease, called by him Chamæleontia, from some supposed resemblance between persons afflicted with it, and the chamæleon. It appears, from the following dialogue between two fictitious persons, Yates and Field, that the treatment of it was similar to that employed in siphylis.

"John Yates,—I judge his new invented way of curation to be extreme and dangerous to the patient, for both the fumes and strait order of diet with the woods, are well known to be dangerous, and yet many times doth not that which they promise. But yet, if his way be perfect, it is more to be liked, and he worthy praise.

"John Field,—His way is void of danger, easy to the patient, exact also, and perfect."

Dr. Cunningham wrote prefatory epistles to some works of Gale and Halle, which shew him to have been a man of considerable learning. Aikin's Biographical Memoirs of Medicine.

CUNNINGHAM'S Island, in *Geography*, an island of Upper Canada, situated at the W. end of lake Erie, S. westerly of the Bass islands, and southerly of Ship island.

CUNNINGHAMIA, in *Botany*. Schreb. gen. 1720. Mart. Mill. (Malanea; Lam. Ill. 174. Antirhea; Vent.

2. 581. Malanea & Antirhea; Juss. 203, 204.) Class and order, *tetrandria monogynia*. Nat. Ord. *Rubiaceæ*, Juss.

Gen. Ch. *Cal.* Perianth one-leafed, four-toothed, very small, permanent. *Cor.* monopetalous; tube short; border four-cleft; lobes egg-shaped, spreading. *Nectary* a rim furrounding the base of the style. *Stam.* Filaments four, inserted into the throat of the tube; anthers roundish or oblong. *Pist.* Germ inferior, roundish; style siform, bifid; stigmas obtuse. *Peric.* Drupe egg-shaped, crowned with the calyx; nut two-celled. *Seeds* one in each cell, oblong.

Eff. Ch. Calyx superior, very small, four-toothed. Corolla monopetalous, with a short tube. Drupe two-celled, two-seeded.

Sp. 1. *C. farmentosa*. Mart. (Malanea; Desf. Enc. 1. Lam. Ill. 1468. tab. 66. fig. 2. Aubl. Guian. 3. tab. 41.) "Leaves egg-shaped, wrinkled, tomentous underneath; racemes axillary, compound, elongated." A shrub. *Stem* about six feet high, four or five inches in diameter, with a reddish, wrinkled, cracked bark. *Branches* supporting themselves by the trunks, and climbing to the tops of very large trees; branchlets numerous, very long, slender, knotty, clothed with a reddish down, many of them hanging down to within eight or ten feet of the ground. *Leaves* two on each knot, opposite, six or seven inches long, about four broad, entire, often a little rolled inwards; green above; reddish and downy, with prominent veins underneath; petioles scarcely half an inch long; stipules two to each leaf, acute, tomentous, caducous. *Flowers* small; in loose, axillary, solitary, compound, tomentous racemes, which are longer than the leaves, blueish; stamens rather long. *Fruit* oblong oval, smooth. A native of Guiana. 2. *C. bifurcata*. (Malanea bifurcata; Desf. 2. Lam. 1466.) "Leaves egg-shaped, acute at both ends, nearly smooth; peduncles forked at their upper part; flowers unilateral." A shrub. *Branches* woody, opposite, obscurely four-cornered, greyish, leafy chiefly towards the top. *Leaves* two inches long, or more, about an inch broad, opposite, entire, green on both sides; with tufts of hair underneath, springing from transparent glandular points at the axils of the nerves; petioles from three to four lines long, channelled; stipules accompanied by short whitish hairs above the place of their insertion. *Flowers* small, sessile, in two, but apparently unilateral rows, which are situated on each of the forks of the short, axillary, solitary common peduncles. *Drupe* scarcely half the size of a grain of wheat, oval, beset with very short hairs. Supposed to be a native of the Caribbee islands. 3. *C. nitida*. (Malanea nitida; Desf. 3. Lam. Ill. 1467. Langeria lucida; Swartz. prod. 48.?) "Leaves egg-shaped, quite smooth, shining; peduncles dichotomous." Whole plant smooth, with the exception of very small tufts of hairs, on glandular transparent points, at the axils of the nerves, underneath the leaves. *Branches* woody, greyish, cylindrical, with a rather uneven bark. *Leaves* three or four inches long, about an inch and half broad, opposite, entire, on very short petioles; stipules intrafoliaceous, oval-acuminate, caducous. *Flowers* small, sessile, or nearly so, alternate, a little distant from each other on the ramifications of the common petioles; common petioles nearly the length of the leaves, axillary, solitary, several times dichotomous. *Fruit* oval, about a quarter of an inch long; nut oblong, angular. A native of the Caribbee islands. 4. *C. verticillata*. (Malanea verticillata; Desf. 4. Lam. Ill. 1465. Pl. 66. fig. 1. Antirhea; Juss. Commerf.) "Leaves inversely egg-shaped, acuminate, whorled, generally in threes; peduncles axillary, forked." A small tree. *Branches* woody, cylindrical, smooth, greyish. *Leaves* entire, smooth above, with small

tufts of hair underneath, as in the two preceding species, about two inches and a half long, and little more than one broad; petioles about a quarter of an inch long; stipules intrafoliaceous, lanceolate, acute. *Flowers* small, sessile, unilateral, near together on the upper part of the forks of the common peduncle. Common peduncles axillary, solitary, slightly hairy, an inch long or more; calyx cloathed with short hairs; corolla hairy on the outside, longer in proportion than in the other species; anthers oblong, almost sessile. *Fruit* about the size of a grain of wheat. A native of the isles of France and Bourbon.

CUNNOR, in *Geography*, a river of S. Wales, which runs into the Tave, in the county of Glamorgan.

CUNNUS, in *Anatomy*, the *puendum muliebre*; or the anterior parts of the genitals of a woman, including the *labia pudendi*, and *mons Veneris*.

CUNOCEPHALI, in *Mythology*, from *κυν*, *dog*, and *κεφαλη*, *head*, a kind of baboons, or animals with heads like those of dogs, which were wonderfully endowed; and preserved, with great veneration, by the Egyptians, in many of their temples. It is related, that by their assistance the Egyptians found out the particular periods of the sun and moon, and that one half of the animal was often buried, while the other half survived; and that they could read and write. This strange history, Dr. Bryant imagines, relates to the priests of Egypt, styled *caben*, to the novices in their temples, and to the examinations they were obliged to undergo, before they could be admitted to the priesthood. The Egyptians, being much addicted to the study of astronomy, founded their colleges upon rocks and hills, called *caph*, and from their consecration to the sun, *caph-el*; whence the Greeks deduced *κεφαλη*, and from *caben caph-el* they formed *κυνοκεφαλος*. *Caben-caph-el* was some royal tennary in Upper Egypt, whence they drafted novices to supply their colleges and temples. By this etymology he explains the above history. The death of one part, while the other survived, denoted the regular succession of the Egyptian priesthood. As the *cunocephali* are said to have been sacred to Hermes, who was the patron of science, and particularly styled *caben*, or *canis*, their college and temple were probably in the nome of Hermopolis; and the *cunocephali* are said to have been worshipped by the people of that place. They formed a sacred college, whose members were persons of great learning; and their society seems to have been a very ancient institution. They were particularly addicted to astronomical observations; and by contemplating the heavens, styled *Ouran*, they learned to distinguish the seasons, and to divide the day into parts. The *cunocephali* are also found in India, and other parts of the world. Herodotus (lib. iv. c. 191.) mentions a nation of this name in Libya; and speaks of them as a race of men with the heads of dogs. In the vicinity of this people, he places the *acephali*, men with no heads, but with eyes in the breast. These and the *acephali* were thus denominated from their place of residence, and from their worship; the one from *Caben-caph-el*, the other from *A-caph-el*; each of which appellations is of the same purport, the right noble, or sacred rock of the sun. Many places were named *Cunocephale*; all which were eminences, or buildings situated on high, agreeably to the etymology above given. The citadel of Athens was so called by Xenophon; and those who speak of the *Cunocephali* describe them as mountaineers. There was a promontory of this name upon the coast of the Red sea, mentioned by Strabo; and another in Coreyra. Bryant's *Analysis of Ancient Mythology*, vol. i. p. 329, &c.

CUNODONTES, a people mentioned by Solinus, and Isidorus, and by them supposed to have the teeth of dogs.

They were probably denominated, says Dr. Bryant, from the object of their worship, the deity *Chan-Adon*, which the Greeks expressed *Κνωδων*, and thence called his votaries *Cunodontes*. *Ibid.* vol. i. p. 341.

CUNONIA, in *Botany*, (from J. C. Cuno of Amsterdam, who described his own garden in Dutch verse, 1750.) Linn. Gen. 556. Schreb. 761. Willd. 884. Juss. 310. Vent. 3. 284. Class and order, *decandria digynia*. Nat. Ord. *Saxifragæ*. Juss.

Gen. Ch. *Cal.* five-leaved, much shorter than the corolla; leaves egg-shaped, concave, acute. *Cor.* Petals five, inversely egg-shaped, spreading. *Stam.* Filaments ten, awl-shaped, longer than the petals; anthers roundish, didymous. *Pist.* Germ superior, conical; styles two, the length of the stamens; stigmas obtuse. *Peric.* Capsule oblong, acuminate, two-celled. *Seeds* numerous, roundish.

Ess. Ch. Corolla five-petalled. Calyx five-leaved. Capsule two-celled, acuminate, many-seeded. Styles longer than the flower.

Sp. C. *capensis*. Linn. Sp. Pl. Mart. Lam. Ill. Pl. 371. (*Oosterdykia floribus spicatis pentapetalis*; Burm. Ar. 259. tab. 96. *Arbuscula arbnti alari foliis*; Pluk. alm. 45. tab. 191. fig. 4.) A shrub. *Stem* knotty, leafy towards the summit, terminated by a singular oval-oblong petioled leaflet, which Linnæus calls a gland, although it is an inch long or more. *Leaves* large, opposite, petioled, winged; leaflets five or seven, lanceolate, ferrated, very smooth. *Racemes* in terminal pairs, one on each side of the singular leaflet, erect. *Flowers* very numerous, small, pedicels, several proceeding from one point. A native of the Cape of Good Hope.

CUNONIA *floribus sessilibus*; Buttn. Mill. ic. See ANTHOLYZA *cunonia*.

CUNTLINE, in *Rigging*, denotes the intervals between the strands of a rope.

CUNTUR, in *Ornithology*. See CONDOR and VULTUR *Gryphus*.

CUNUGUATI, CUNUGNALES, or *Nueva Ville Rié*, in *Geography*, a town of South America, in the government of Buenos Ayres, and province of Paraguay.

CUNUSITANI, in *Ancient Geography*, a people placed by Ptolemy on the E. coast of the island of Sardinia.

CUOLAGH, or QUOYLACH Bay, in *Geography*, lies at the south side of the entrance into Kenmare river, on the south-west coast of Ireland. At the head of it is a safe and well sheltered creek for small vessels. Long. 9° 53' W. Lat. 51° 38' N.

CUOMI, a town of China, of the third rank, in the province of Chang-tong; 15 miles N.W. of Kiao.

CUOZGNE', a town of France, in the department of the Doire, in Piedmont, in Italy, which formerly belonged to Sardinia. It is the chief place of a canton, in the district of Ivécé, with a population of 3250 individuals. The canton has 13 communes, and 7847 inhabitants.

CUP, CALYX, a vessel so called, of various forms and uses. In the Ephem. German. we have a description of a cup made of a common pepper-corn, by Oswald Nerlinger; which holds one thousand two hundred other ivory cups, each having its several handle, all gilt on the edges; with room for four hundred more.

CUPS, among *Herbalists*, are those short green husks in which flowers grow; some being divided into two, three, four, five, or six leaves. See CALYX.

CUP-fountain. See FOUNTAIN.

CUP-galls, in *Natural History*, a name given by authors to a very singular kind of galls found on the leaves of the oak, and some other trees. They are of the figure of a cup,

or drinking-glasses, without its foot, being regular cones, adhearing by their point or apex to the leaf; and the top, or broad part, is hollowed a little way.

Beside this species of gall, the oak-leaves furnish us with several others; some of which are oblong, some round, and others flattened; these are of various sizes, and appear on the leaves at various seasons of the year. They all contain the worm of some small fly; and this creature passes all its changes in this its habitation, being sometimes found in the worm, sometimes in the nymph, and sometimes in the fly state, in the cavity of it.

CUP shell. See SHELL.

CUPA, among the Ancients, a kind of boats, used in laying bridges over rivers, being broad below, and narrow above.

CUPAMENI, in Botany. Rheed. See ACALYPHA indica.

CUPANIA, (named from F. Cupani, a Franciscan monk of Sicily, author of *Plantæ Siculæ*, 1692, and *Hortus Catholicus*, 1696.) Linn. Gen. 279. Schreb. 645. Gært. 1051. Juss. 149. Molina; Juss. 248. Commers. Clafs and order, *ortandria monogynia*. Nat. Ord. *Tribilata*; Linn. *Sapindi*; Juss.

Gen. Ch. Cal. Perianth five-leaved, (five-parted? Swartz) inferior; leaflets oblong, erect, (egg-shaped, acuminate, concave; Sw.) Cor. Petals five, cowered at the top, upright, (clawed, ciliate; Sw.) Stam. Filaments eight, capillary, longer than the calyx, erect, (from the base of the corolla, broader at the bottom, villous, the length of the petals; Sw.) anthers incumbent. Pist. Germ egg-shaped (roundish, three-cornered; Sw.); style short, tritid (at the tip, awl-shaped, the length of the stamens; Sw.) stigmas blunt, (small, almost upright; Sw.) Peric. Capsule coriaceous, turbinate-ovate, three-lobed, (obtusely three-cornered, large; Sw.) three-celled, three-valved. Seed solitary, (two in each cell; Plum.) with a bell-shaped crenate aril, embracing the seed like a calyx, (coloured, fastened to the seed above the middle; Sw.)

Sp. 1. *C. tomentosa*. Mart. 1. Willd. 1. Swartz. Prod. 61. Fl. Ind. Occ. 2. 657. (*Trigonis tomentosa*; Jac. Am. 102. 1.) "Leaves pinnated; leaflets inversely egg-shaped, retuse, ferruginous-tomentous underneath." A small upright tree, twelve feet high. Younger branches and ribs of the leaves slightly tomentous. Leaves alternate, half a foot long; leaflets usually three pairs, without an odd one, alternate, oblong, attenuated at the base, emarginate, serrated. Racemes seven inches long, axillary, erect, simple. Flowers yellowish, small, numerous, on short pedicels. Jacq. A native of Hispaniola, on woody mountains. 2. *C. glabra*. Mart. 2. Willd. 2. Swartz. Prod. 61. Fl. Occ. 2. 659. (*C. arborea, foliis oblongis crenato-ferratis, distiche et alternatim sitis, racemis laxis propendentibus*; Brown. Jam. 178. *C. Americana*; Linn.? *C. castaneæ folio, fructu fericeo & ramoso*; Plum. Gen. 45. *Burm. Amer. tab. 110*?) "Leaves pinnated; leaflets egg-shaped, obtuse, crenated, smooth." A shrubby tree, twelve or fourteen feet high. Leaves large. Racemes loose, drooping. Brown. A native of Jamaica and Hispaniola. 3. *C. saponarioides*. Mart. 3. Willd. 3. Swartz. Prod. 62. Fl. Ind. Occ. 2. 661. "Leaves pinnated; leaflets oblong, attenuated, quite entire, scabrous-pubescent underneath." A native of the West Indies. 4. *C. laevis*. (Molina; lævis; Willd. Lam. Ill. Pl. 305. fig. 1.) "Leaves pinnated, in two pairs; corymbs panicle; fruit inversely egg-shaped, truncated, triquetrous." Leaves abruptly pinnated; leaflets opposite, oblong, obtuse, attenuated at the base, quite entire. Panicle axillary, composed of small corymbs. A native of the island of Bourbon. 5. *C. canescens*. (Molina; canescens; Willd. Roxb. Corom. 1. 43. tab. 60.) "Leaves pinnated, in two pairs; racemes panicle; fruit egg-shaped."

Bark of the branches cinereous, scabrous. Leaves abruptly pinnated; leaflets elliptical, rather acute, quite entire. Panicle axillary, shorter than the leaves, composed of long racemes. A native of the East Indies. 6. *C. alternifolia*. (Molina; alternifolia; Willd. Lam. Ill. Pl. 305. fig. 2.) "Leaves pinnated; leaflets alternate, retuse; panicle clove." Leaflets about eight, alternate, inversely egg-shaped, very slightly retuse, quite entire, petioled. Panicle axillary, shorter than the leaves, composed of small corymbs. A native of the island of Bourbon.

Obs. There is much discrepancy in authors with respect to this genus and its species. The original cupania of Linnæus contained only one species, taken up by him from Plumier, and described as a pentandrous plant, with a three-leaved calyx, a small tritid style, and a one-celled, three-valved capsule, containing six seeds, embraced by a bell-shaped aril in the manner of a calyx. La Marck, in the *Encyclopedie Methodique*, has also but one species, which he considers as the *C. americana* of Linnæus, quoting Plumier, and adding Brown's Jamaica-plant as another synonym. Not having seen the flowers, he copies their generic characters from Linnæus, but gives the following description of the fruit, taken from a dried specimen in his possession. Capsule top-shaped, coriaceous, silky, and reddish on the outside, three-celled, three-valved, opening from the summit to the base, with the adhering partitions. The specimens from which Gærtner described the fruit of his *C. americana* came from Jamaica, and have only one seed in each cell: hence, he was induced to doubt whether it be not a different species from the Domingo-plant of Plumier, which is said to be silky white, and to have two seeds in each cell. He agrees with Linnæus in attributing to it an aril, of which La Marck takes no notice, and differs from the last-mentioned author in describing the capsule as perfectly entire in its lower part, and splitting into valves only half way down. Willdenow thinks it uncertain whether the *tomentosa* or *glabra* of Swartz be the *americana* of Linnæus. Jussieu separates cupania and *molinæa*; and Willdenow states that they differ in the latter's having no style and no aril to the seeds. But Mr. Dryander (*Linnæan Transactions*, vol. ii. p. 232.) pronounces them the same genus. Under the sanction of such high authority, we have not scrupled to unite them, though we have not ventured to attempt the establishment of an essential character. Professor Martyn, in his edition of Miller, refers from *molinæa* to cupania; but under that article he has inserted only Swartz's three species of cupania. La Marck, in the plates of his *Illustrations*, has figured two species of *molinæa*; but as the letter-press to that work is not finished, we are not able to ascertain his ideas concerning the genus. He has given no figure of cupania. The gelonium of Gærtner, formed from some imperfect specimens of a tree found in the isle of Bourbon, seems to differ from cupania chiefly in having a two-celled capsule.

CUPAR, or COUPAR OF FIFE, in Geography, a royal burgh, and county town of Fifeshire, Scotland, is seated on the northern bank of the river Eden, nearly in the centre of the county.—It is also the name of a parish, which comprehends an area of about five miles in diameter, and is divided into two parts by the river Eden. The borough, at an early period, was possessed by the thanes of Fife, who held their courts of justice here. It is now a respectable well-built town, with paved streets; and is governed by a provost, three bailies, a dean of guild, and thirteen counsellors. Among the public structures of the town, the church, with a handsome spire, is prominent. Next to which is the court-room and town-house; but the public gaol for the county is reprobated by Dr. Campbell, in his communication to sir

John Sinclair, as mean, filthy, and, in every respect, disagreeable to the character of the place, and of the district. In Cupar and its neighbourhood, a considerable quantity of coarse linens is manufactured: and it is stated, that "about 500,000 yards are annually stamped" in this town. The linen merchants are said to pay annually about 45,000*l.* to the manufacturers. In the year 1794, 223 looms were employed in this business. Here are also some considerable tanyards, and a bleach-field; also brick and tile-fields. In the year 1800, Cupar contained 796 houses, and 4463 inhabitants. Sinclair's Statistical Account of Scotland.

CUPAR, or COUPER of ANGUS, so named, to distinguish it from Cupar in Fifeshire, Scotland, is a considerable town and parish, situated in the valley of Strathmore, and lying partly in Angus, and partly in Perthshire. The parish occupies an area of above five miles in length, by one in breadth, and contains nearly 2400 acres. The lands are mostly inclosed; and agriculture has been progressively improving for the last twenty years. In the parish are five mills, and a considerable linen manufactory, the extent of which may be partly estimated, when it is known, that in the year 1792 there were 97,810 yards of brown linen stamped here. At the bleach-field of Balgirtho, about 200,000 yards are annually whitened. The population of the parish, in 1793, according to the report in Sir John Sinclair's Statistical work, was 2076, "an increase of 585 within the preceding forty years. According to the reports of 41 Geo. III. A. D. 1800, the parish then contained, in the Perth division, 420 houses, and 2169 inhabitants; and in the Angus division 59 houses, and 247 inhabitants; making a total of 479 houses, and 2416 persons. In the parish are the vestiges of an encampment, of a square form, comprehending about 24 acres, and said to have been formed by the army of Agricola, in his seventh expedition. (See Roy's Military Antiquities.) Within the vallum of this fortress, Malcolm IV. in 1142, founded, and richly endowed, an abbey for Cistercian monks. Parts of the building remain.

The town is seated on a rivulet, which divides it, and also the counties. It is 12 miles from Perth, and nearly the same distance from Dundee. Here are a weekly market on Tuesday, and four annual fairs. In the year 1781, a tannery was formed here, and has produced so much, as to turn out, in one year, 2600 hides of leather. The town has gradually improved; and its streets are provided with lamps and pavements. Sinclair's Statistical Account of Scotland.

CUPEA, a town of European Turkey, in the province of Moldavia, 20 miles N. of Suczava.

CUPEL, or CUPELLATION, in *Chemistry*. Cupellation is a process employed in the assay of gold and silver, by which the alloy, or base metal, with which any sample of the noble metals may be mixed, is separated, and its proportion ascertained. The rationale of this process is founded on the following facts.

Of all the metals hitherto discovered, three alone (namely, gold, silver, and platinum,) are incapable of being oxydated or rusted by mere exposure to air, either when solid or in fusion; and hence gold and silver anciently acquired the name of *noble* metals. All other metals tarnish and are oxydated when kept in fusion in open vessels, (some with extreme ease, others not without difficulty,) so that by constantly removing the skin of oxyd as it forms, and exposing fresh surfaces to the air, the whole metal may be finally changed into oxyd. Hence when a mixture of a *noble* and a *base* metal (or in other words, of a metal unchanged, and of one oxydable by fusion,) are melted and exposed to air, the base metal gradually changes to an oxyd, and is thrown off in the form of coloured scales or

glassy pellicles, and the noble metal remains unaltered. This separation, however, is not in all cases equally accurate, for where the *alloy* or base metal is not very easily oxydable, and where the proportion of the alloy to the noble metal is but small, the affinity which the latter exercises towards the former is so great, and increases so much with the decreasing proportion of the alloy, as to protect it completely from any further action of the air, and to preserve it in the metallic state. Thus, for example, if a mixture of equal parts of silver and copper are kept in fusion in an open vessel, a crust of brown oxyd of copper readily forms, which, if removed, is succeeded by other crusts that continue to be produced, but with increasing difficulty, till the copper is only about a twelfth of the mass; but after this point scarcely any continuance of heat will complete the oxydation of the remaining portion of the alloy.

The same, however, does not take with lead when alloyed with silver, for on fusing the mixed mass the lead speedily oxydates on the surface, and at the same time vitrifies into litharge, and if this is removed, every particle of lead may be thus extracted, and the silver alone left behind perfectly pure.

Now it is found that when a triple alloy of silver, copper, and lead, is mixed together (the quantity of lead being several times greater than that of the copper) the oxydability of the copper is so much increased by the presence of the lead, owing to the affinity of the two oxyds, and the solubility of the copper oxyd in that of the lead when in fusion, that the silver is no longer able to protect any portion of the copper from oxydation, and the whole alloy is removed from the noble metal, even to the last sensible particle.

This, therefore, is the principle on which the process of cupellation is founded, namely, that of mixing the alloyed noble metal with a considerable portion of lead, exposing the whole to a melting heat with access of air, and thus converting to an oxyd both the lead and every other base metal present in the mass, till the noble metal is left behind perfectly pure.

This process is performed both in the large way in extracting silver from the ore and refining it, and in the small way in assaying those mixtures of gold and silver with different alloys which are used in such large quantities for plate, coin, &c. &c. The former, indeed, is technically called refining, and the latter only cupellation, and some little variation in the management of each takes place, but the principle in both is precisely the same.

Cupellation is usually performed in a furnace contrived for the purpose, and capable of giving a pretty intense heat. The body of the furnace is a hollow four-sided prism, in the middle of which is fixed an earthen vessel called a muffle, of an oven shape, vaulted at top, entirely open at one end, and with a flat floor at bottom. The open end of the muffle comes in close contact with a corresponding hole in the side of the furnace, and is luted to it, and the closed end projects as far as the centre of the furnace. By this contrivance the muffle is heated by the fuel round it, whilst not a particle of the burning charcoal can fall into its cavity, and a gradation of heat is also obtained within it, being the most intense at the closed end which is in the centre of the fire, and the least at the open end contiguous with the hole in the side of the furnace. The cavity of the muffle being large in comparison with the vessels which it is to contain, a considerable body of heated air is constantly circulating over the melted metal, which is necessary to keep up the constant oxydation of the lead and alloy on which the process of cupellation depends.

But as it would be nearly impracticable to keep up the requisite

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requisite heat within the muffle, whilst one side was entirely open to the external air, a small vestibule or shelf of iron is made to project a few inches from this opening, on which several long cylinders of charcoal are heaped up whilst the process is going on, which take fire by touching the end of the red-hot muffle, and partially block up the opening, so as fully to heat the outer air in passing to it.

The melted metal is contained in small earthen vessels called *cupels*, which are small solid cubes or cylinders about an inch or an inch and a half across, and with a small depression at top which lodges the melted globule. The cupels may be made of any earth of little cohesion, such as the ashes left after the lixiviation of the saline residue of burnt wood, which are much used in *refining*; but for *cupellation*, or assaying in the small quantities, the cupels are made entirely of bone-ash or phosphat of lime, which possesses the qualities of porosity and infusibility in an eminent degree. This is ground to a fine powder, then a little moistened with water, and the mass (which possesses scarcely any cohesion) is forcibly struck into an iron or a brass mould, where it takes the requisite form, and on drying becomes solid enough for use. The cupels are so small that several of them may be ranged side by side on the floor of the muffle, and they are so extremely porous that the fused oxyd of lead sinks into their substance with as much ease as water into a lump of chalk, but all of the globule of metal that remains in the metallic state is detained in the little cavity on their surface. It should be observed, that the cupels cannot absorb more than their own weight of litharge at the utmost, so that the quantity of metal used and the required proportion of lead must be regulated accordingly.

Experience has shewn the extreme accuracy and nicety of manipulation requisite to conduct cupellation with uniform exactness, and yet there is no process in which accuracy is of more real importance, since the quantities operated on are at most only a few grains, which are taken as samples of the purity and consequent value of very large masses of gold and silver. Hence, too, scales and weights of uncommon delicacy are required.

Cupellation of Silver.

For the assay of silver a clean piece of the metal is taken, which is not more than 36 grains, and less if the alloy appears abundant, is laminated, and weighed with the utmost care. It is then wrapped up in a piece of sheet-lead of the proper weight, or both the silver and lead are folded in paper ready for use. The purity of the lead is important; for all lead naturally contains a little silver, which, if not removed, might make a sensible error in the assay. The lead is, therefore, always revived from litharge; in which state it is remarkably pure, and contains no more than $\frac{1}{2}$ grain of silver in the pound, which quantity may be entirely neglected.

The mode of proportioning the quantity of lead to the estimated quantity of alloy in the silver will be presently noticed.

The fire being kindled, and the floor of the muffle sprinkled with chalk, to prevent the cupels from being glued to it in the process, the muffle and empty cupels are first made fully red-hot, and the cylinders of charcoal are put against the open end of the muffle, as already described. The silver and lead are then dropped into the cupel, and the charcoal replaced. The metals immediately melt together; and, when red-hot, the following appearances take place. The melted globule begins to send off dense fumes, which rise to the roof of the muffle, and at the same time

a thin stream of red fused matter is seen constantly flowing down the sides of the globule to the surface of the cupel, through which it sinks. This fume is the oxyd of lead evaporated by the heat, and the stream of fused matter is the melted litharge, together with the copper or other alloy of the silver which is thus extracted from it. In proportion to the intensity of the heat are the density of the fume, the violence with which it is given off, and the rapidity with which the melted oxyd *circulates*, as it is termed, or falls down the sides of the metal. As the cupellation advances, the melted globule becomes rounder, and its surface more freaky, till, in about fifteen or twenty minutes, according to circumstances, all the lead and alloy are vitrified and absorbed by the cupel, the last portions of litharge collect in large bright streaks, which disappear with great rapidity, shewing the melted metal beneath bright with iridescent colours, which suddenly after becomes opaque, and exquisitely white and brilliant, exhibiting the clean surface of pure melted silver. This last appearance is called the *lightning* of the metal, and it is highly beautiful, as if a red curtain was suddenly withdrawn from the metal. The operation is now finished, and the cupel is drawn forwards to the open side of the muffle, that it may cool gradually before it is removed; for, if it were suddenly fixed, the globule is apt to shoot into an arborescent surface in the act of congealing, by which small particles are thrown out of the cupel and lost, and the assay is spoiled.

In the cupellations made at the mint assay-office, two assays are made of the same metal, and no sensible difference between the weight of the two buttons is allowed to pass, as ascertained by scales, that turn with the $\frac{1}{1200}$ th of a grain.

The process is considered as well performed when the button of silver adheres but slightly to the cupel; when its shape is very considerably globular, and not flattened at the margin; when it is quite white, clean and brilliant, and not fouled or spotted with any remaining litharge. In this state of purity, the surface of the button is never quite smooth, but is somewhat scaly or striated, the effect of a very strong tendency to crystallization, which perfectly pure silver possesses, but is not found in plate or alloyed metal. Under the microscope, this irregularity of surface is still more observable, and the scales seem to incline to a pentagonal form.

Where the alloy of the silver is only copper, as is usually the case, the cupel round the button is stained of a brown grey.

The management of the fire in cupellation is of great importance. If it is so intense that the cupel can scarcely be distinguished from the muffle, and the fume of litharge can hardly be discerned through the dazzling heat, not only much of the lead is volatilized to mere waste, but even a portion of the silver is carried off along with it, which renders the assay inaccurate. Even silver alone, and in the greatest purity, may be evaporated by intense heat as M. Tillet (an ingenious French chemist, and master of the mint at Paris) found, by an experiment, in which a button of pure silver was intensely heated for two hours, and had lost thereby no less than $\frac{1}{3}$ of its weight. If one vessel is inverted over another that contains the silver, in this case the inside of the upper one is found studded with minute globules of silver, when viewed through a common lens. On the other hand, when the fire is too slack in cupellation, the litharge is not fully melted as it forms, and, therefore, is not absorbed by the cupel, but lies on the surface as a red scoria, and the circulation is very sluggish. The proper medium of heat is, when every thing within the muffle is fully red-hot; when

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the fume of litharge is abundant, and visibly rises to the top; and when the circulation goes on rapidly, and the button continues very globular. Towards the end of the process, the heat should be increased as the button, by the constant abstraction of the lead, becomes constantly less easily fusible.

It has been already mentioned, that in cupellation all the alloy of the silver is carried down into the cupel along with, and dissolved in the litharge, provided lead enough be used. But it was also found by M. Tillet, that a small portion of the silver is at the same time carried down with the lead; so that, when perfectly pure silver is cupelled with lead of known purity, the button of silver left after the process never weighs quite so much as before, even though the heat employed is so moderate as not to volatilize any of the silver. As a proof that some of the silver is carried down into the cupel, M. Tillet ground this vessel to powder, and fused it with a reducing flux, whereby he recovered nearly all the lead that had been used, and which now contained ten times as much silver as its natural retent of this noble metal, nine tenths of which, therefore, must have been derived from the button of silver during cupellation. Accordingly, on cupelling this lead, *per se*, it left behind all this excess of silver, and now only carried down its natural retent, which amounts to about $\frac{1}{115}$, or half a grain in a pound French.

It remains to give the proportions of lead to alloy, which have been found the most useful in cupellation, and the method of estimating the quantity of alloy previous to this operation, with sufficient exactness to guide the artist. The ancient assayers used for this purpose small slips or bars of metal, made with pure silver and copper, in known proportions, in a regularly increasing series, from the least to the greatest quantity of alloy usually required. These sets of bars were called *touch-needles*; and, by comparing the silver to be assayed with these needles, in colour, tenacity, and other external marks, its proportion of alloy was guessed at with sufficient accuracy to determine the quantity of lead required in the cupellation. These needles are now, however, almost totally disused in silver-assaying, as an experienced assayer is able to judge of the fineness of silver, with quite sufficient accuracy, by the ease with which it is cut, the colour and grain of the fresh-cut surface, the malleability, the appearances on being heated red-hot, and other tokens.

The proportion of alloy (if copper) to the silver being found with sufficient exactness, that of the lead is thus estimated. Copper, when taken by itself, requires from 10 to 14 times its weight of lead for complete scorification on the cupel. But all admixtures of fine metal tend to protect the copper from the action of the litharge, the more, in proportion to the quantity of fine metal. Thus, when one part of copper is mixed with three of silver, no less than 40 parts of lead are required; and one part of copper with 11 of silver require 72 parts of lead. It should be observed, however, that a considerable difference in the respective proportions of lead to copper is observed by different assayers, though the general principle of increasing the lead in proportion to the quantity of fine metal is indisputable.

The following table will shew some of the proportions used in the French mint, as given by M. Tillet, and also others used by the German chemists, as given by Gren:

Copper.	with	Silver.	requires	Lead.
1	$\frac{1}{1}$	0	—	10.
1	—	$\frac{1}{15}$	—	17 Fr.
1	—	$\frac{1}{11}$	—	28 Fr.
1	—	$\frac{1}{3}$	—	20 Ger.
1	—	$\frac{1}{3}$	—	29 Fr.

Copper.	with	Silver.	requires	Lead.
1	—	$\frac{1}{2}$	—	30 Fr.
1	—	1	—	32 Fr.
1	—	2	—	36 Fr.
1	—	3	—	40 Fr. and Ger.
1	—	4	—	56 Ger.
1	—	5	—	48 Fr.
1	—	7	—	64 Ger.
1	—	11	—	72 Fr.
1	—	15	—	96 Ger.
1	—	23	—	96 Fr.
1	—	30	—	128 Ger.

Cupellation of Gold.

The process of cupellation is the same for gold as for silver, the alloy, in both instances, being worked off by lead; but several curious circumstances take place with mixtures of gold with other metals, which are not easily explicable. When pure gold is mixed with lead and cupelled, the whole of the lead is not separated, as it is with pure silver, but a small portion remains combined with the gold sufficient to impair its colour and ductility. If, besides gold and lead, the mixture contains copper to the amount of $\frac{1}{2}$ of the gold, the whole of the lead will now be separated in cupellation, but almost the whole of the copper will remain. If, in addition to the above ingredients, the alloy contains a somewhat greater proportion of silver than it does of copper, this latter is separated by cupellation, but a little of the lead remains. But if the amount of silver equals or exceeds that of the gold, all the lead and copper are separated, and only the gold and silver remain.

As, therefore, the object of cupellation is to separate the whole of the alloy of base metal, it is necessary, in assaying gold, to add first a very considerable quantity of silver, then to work off the copper, and other base metal, by lead on the cupel, and afterwards to separate the gold and silver by the process of *parting*, as it is called, by means of nitric acid.

The assay of gold, therefore, is more complicated than that of silver, and requires the intervention of this latter metal. The quantity of silver must, as already mentioned, be at least equal to that of the gold, to enable the lead to extract all the copper in cupellation; but, in fact, the silver is generally three times as much as the gold, otherwise, though all the copper may be removed by a much less proportion, the subsequent separation of the silver from the gold by nitric acid cannot well take place. For it is found that, unless the silver be in this large quantity, the gold, which is not itself touched by the nitric acid, also protects a portion of the silver from the acid, and the separation is not complete.

The cupellation of gold therefore is conducted in the following manner: the quantity of copper or other alloy present, being first estimated as accurately as possible in the way that will be presently mentioned, as much fine silver is added to the mixture, as will make the gold only a *fourth* of the mass when the base alloy has been removed. If the gold is already alloyed with any silver, a proper allowance is of course made for the estimated quantity. This proportioning of the silver to the gold, and melting them together, is called *quartation*, the gold being reduced thereby to one-fourth of the mass of noble metal. To the mixture the requisite quantity of lead is then added (which is nearly the same as in silver assaying) and the cupellation is conducted exactly in the same manner, only that a higher heat may be given, as the silver in this mixture is not volatilized by a strong fire, as it is in mere silver assaying. The *lightning* takes

takes place here also when every particle of lead and other base metal is removed, and only the gold and silver are left on the cupel.

The separation of these noble metals by nitric acid, and the exact process of parting, will be described under GOLD. It may be just mentioned, however, that the button is first flattened, and then rolled out into a small coil, and then put into a glass, and with boiling nitric acid, by which all the silver is extracted, and the gold alone is left behind in perfect purity.

The quantity of alloy in any mixture of gold with other metals is estimated previous to cupellation, partly by the general appearance (the nature of the alloy being known) and partly by the use of the touch-stone. In judging by the general appearance alone, much advantage may be derived from touch-needles, but the case is more complicated here than in silver assaying, since three metals at least are concerned in gold assaying, namely, gold, silver, and copper. Therefore if these needles are used, there must be several sets of them adapted to the nature of the alloy.

The trial by the touchstone is another simple and very ingenious method of forming some estimate of the proportion of alloy in any gold mixture. For this purpose the piece of metal to be tried is rubbed hard upon a piece of black basalt or black pottery, so as to make a broad bright metallic streak by the abrasion of some of the metal. This shews at once the true colour of the alloy, which may also be compared with another streak made by a touch-needle beside it. A drop or two of nitric acid is then spread upon the streak, and after remaining about ten seconds, it is washed off, and the effect observed. If the streak preserves its golden colour unaltered, the metal is judged to have a certain degree of fineness, as gold is insoluble in this acid; if it looks red, dull, and coppery, it is less fine; if the streak is almost entirely effaced, the metal contains very little gold; and thus by the assistance of this acid, an experienced assayer will come at a sufficiently accurate knowledge of the quantity of alloy to guide him in the addition of lead and silver in the cupellation. It is found however that though pure nitric acid will readily dissolve copper singly, it will not act sensibly on this metal, when in mixture with twice its weight of gold, so effectually does the gold protect the copper against this powerful acid. But if a small proportion of muriatic acid is added, the copper will be dissolved when the gold is not more than three-fourths of the mixture, and thus the power of this test is much extended. Vauquelin, in his "Manuel de l'Essayeur," recommends for this purpose an acid composed of 98 parts of nitric acid of 1.34 sp. gr., 2 parts of muriatic acid of 1.173 sp. gr., and 25 parts of water. This does indeed compose a nitro-muriatic acid, which is the proper solvent for gold, but the gold on the touch-stone is not in this case sensibly acted on, owing to the shortness of the application, and the very small proportion of muriatic acid.

Touching is also of great use in determining the value of wrought trinkets which cannot spare so much as 8 or 10 grains for a regular assay.

Cupellation of Alloys of Platina.

On account of the great specific gravity of platina, it was long apprehended that gold might be adulterated with it to a considerable degree without being easily detected, for as platina is equally unoxidable by air as gold and silver, it cannot be scorified by lead on cupel, and being insoluble in nitric acid its separation from gold is not readily effected. It is not difficult, however, to detect this metal when mixed with gold or silver even in very small proportion.

Gold alloyed with so little as one *per cent.* of platina and cupelled in the usual way, with thrice its weight of silver, differs from gold and silver alone in requiring a much greater heat for cupellation and complete fusion of the button; otherwise, when all the lead is worked off, the button remains flat, like a piece of money, and its surface knotty. Even when the button is well fused its edges are much thicker, and rounder than in common gold assays, its colour duller, and especially it appears remarkably crystallized on its surface. Also in cupellation, when the last portions of lead are worked off, the button appears puffy, scarcely iridescent, and does not lighten, or become suddenly brilliant as silver and gold alone, or gold and silver do.

Silver bears alloying with platina better than gold does; but this is never done fraudulently. When the platina does not exceed 5 *per cent.* of the silver, it works easily on the cupel, but the lightning is less observable than with pure silver, and, in particular, the property of crystallizing is still more conspicuous. When the platina amounts to a quarter of the mixture, the button or cupel flattens, and becomes puffy even before all the lead is run off, and its surface shoots up into knobs which, when seen by a magnifier, appear clusters of crystalline points.

Some remarkable occurrences take place with the alloys of gold or silver with platina, when treated with nitric acid, which will be mentioned under that metal.

CUPER, GILBERT, in *Biography*, was born in the duchy of Guelderland, in 1644: his early education was at Nimeguen, and he finished his studies under Gronovius at Leyden. At the age of 25 he was appointed professor of history at Deventer. He was also raised to the principal offices of the magistracy of that city. Here he died in 1716. He published many works of considerable merit; particularly "Observations on various Greek and Latin Authors;" "A Collection of ancient Monuments relative to Egypt;" "An Explanation of the Apotheosis of Homer;" and a "History of the Three Gordians." He maintained a friendly correspondence with the principal literary characters of his time, by whom he was highly esteemed, on account of his great learning. He was elected foreign member of the academy of inscriptions at Paris. *Moreri.*

CUPERIUM, in *Ancient Geography*, a place of Thrace, in the vicinity of Zurule.

CUPERTINO, in *Geography*, a town of Naples, in the province of Otranto; $5\frac{1}{2}$ miles N.E. of Nardo.

CUPHA, in *Ancient Geography*, a river of European Sarmatia.—Also, a town of Africa, in Libya, placed by Ptolemy near the Niger.

CUPHA, or КУРНА. See CUPA.

CUPHEA, in *Botany*. Hort. Kew. 2. 129. Willd. 952. Gært. 255. Juss. 332. Vent. 3. 304. Clafs and order, *dodecandria monogynia*. Nat. Ord. *Salicarie*; Juss. *Calycanthemæ*; Vent.

Gen. Ch. *Cal.* Perianth one-leaved, tubular, striated, five or six-toothed, upper tooth broader, permanent. *Cor.* Petals five or six, inserted into the throat of the calyx, the two upper ones larger. *Stam.* Filaments ten or twelve, in three ranks, unequal, two of them shorter and more hairy; anthers roundish. *Pist.* Germ egg-shaped; style permanent. *Peric.* Capsule oblong, one-celled, valveless, covered by the calyx, and bursting irregularly with it by the enlargement of the receptacle of the seeds. *Seeds* from five to ten, lenticular, erect, attached to the filiform lateral branches of a columnar, triquetrous, free, cartilaginous receptacle.

Ess. Ch. Calyx five or six-toothed, unequal. Petals five or six, unequal, inserted into the calyx. Capsule one-celled; receptacle triquetrous.

Sp. C. *cupressifolius*. Jacq. hort. 2. 83. Pl. 177. Lam. 18. Pl. 477. Mart. tab. 44. fig. 9. (*Lythrum cuphea*; Linn. jun. Supp. 249. *Balsamina Pinto*; Vandell. fasc. 1771. 17. tab. 3. *Root* annual. *Stem* a foot high, cylindrical, erect, pubescent-viscid, purplish, branched. *Leaves* opposite, reticled, ovate-oblong, quite entire, even-surfaced. *Flowers* purple, lateral, solitary, on short peduncles; calyx swollen at the base, pubescent-viscid; nectary a reflexed scale within the gibbous part of the calyx. *Capful* bursting longitudinally by the protrusion of the lengthened receptacle, loaded with the unripe seeds, which come to maturity in the open air. A native of moist shady ground in Brazil. It is readily raised from seed in our botanic gardens.

CUPID, in *Mythology*, one of the companions of Venus, and the god of love. The Cupids were anciently supposed to be very numerous, and accordingly they were the offspring of different parents; but there were two which were the chief, viz. *Eros*, the son of Jupiter and Venus, who delighted in inspiring his votaries with refined sentiments of virtuous love; and *Anteros*, of inferior, and, indeed, contrary character, the descendant of Mars and Venus, or, as some say, of *Aerebus* and *Nox*. The former is said to have been the cause of love, and the latter is represented as the cause of its ceasing; and, therefore, the antiquarians at Florence usually call the two little Cupids at the foot of the Venus of Medici by the names of *Eros* and *Anteros*; and in the air of their faces, and also in their form and attitudes, there is something that corresponds with these names; the upper one being lighter, and of a more pleasing aspect, and the lower one more heavy and sullen. Their darts are of a different nature; that of *Eros* golden, which procures love; and that of *Anteros* leaden, which causes hatred.

Cupid is commonly represented as a child, with soft and fine hair, almost always naked, of a good shape, inclining to plumpness, and furnished with wings, a bow, quiver, and darts, and sometimes with a lighted torch. The ancient artists and poets represent Cupid either as idle and playful, or as very powerful, and governing all things, so that Venus, without his assistance, is weak and impotent. Thus Virgil, *Æn.* i. 668.

“Nate, meæ Vires, meæ magna potentia, solus?”

sometimes caressing, and sometimes tormenting the goddess Psyche, or the soul, riding in a car drawn by two Psychees, or by two butterflies, riding on a lion or a dolphin, &c.

The famous statuary Praxiteles, who flourished about the 114th olympiad, B. C. 324, acquired great honour, by his statues of Cupid. The orations of Cicero against Verres have given celebrity to the marble Cupid, which the orator represents as a rival to one still more famous by the same artist, that formed the pride and the wealth of the Thespians:—a statue spared by Memmius, when he plundered the cities of Greece. We learn from Pausanias, that this marble Cupid of Praxiteles, which was the idol of the Thespians, perished (after a variety of adventures) in a fire at Rome. It has been said that the marchioness of Mantua possessed, in the year 1573, the Cupid of Praxiteles, and the sleeping Cupid of Michael Angelo; but against this fact the testimony of Pausanias has been alleged. Nevertheless, though the Thespian statue suffered the fate reported by Pausanias, the marchioness might possess another Cupid executed by Praxiteles; because it appears that there existed two marble Cupids of acknowledged beauty, by this illustrious sculptor; and among the statues described by C. Illustratus, two Cupids, by the same artist, in bronze, are celebrated as works of exquisite perfection. On one of these, perhaps, the following

epigram was written; though Junius imagined that it was composed on the Thespian Cupid, and that the poet has taken the liberty to turn the marble into brass. We shall subjoin a verified translation of this Greek epigram, translated into Latin by Grotius, from Mr. Hayley's “*Essay on Sculpture*.”

“Julian, the Egyptian prefect, on the Cupid of Praxiteles.”

“Praxiteles, proud slave of my command,
Thus form'd my statue with his fetter'd hand,
Me, couch'd within him, he in bronze portray'd
For Phryne, who with love the gift repaid.
She made her captive mine. To hearts that burn,
Love is for love the only just return.”

CUPIDO, in *Ornithology*, a species of TETRAO; which see.

CUPINOVA, in *Geography*, a town of Servia, on the river Save; 4 miles S. S. W. of Belgrade.

CUPIUS, JACOBUS, in *Biography*, a painter of quadrupeds, living in the 17th century. From the compositions of this artist R. Persyn engraved 13 plates, which were published by N. Vischer in 1641. Heinecken.

CUPOLA, in *Architecture*, the same with *dome*.

The word is Italian, formed of the barbarous Latin *cup-pola*, otherwise called *thola*, and *fornix*.

CUPPÆ, in *Ancient Geography*, a place in Mysia, situated, according to the Itinerary of Antonine, in the route from Nicomedia to Viminacum.

CUPPING, in *Surgery*, is one of the modes of inviting blood to a particular part of the body, by means of a vessel named a CUPPING-GLASS; and it is usual, after the application of this instrument, to employ scarifications, for the purpose of extracting the accumulated fluids. The comparative advantages of local and general blood-letting are elsewhere explained. (See the articles BLEEDING and SCARIFICATION.) The operation of cupping is by no means difficult; but in large cities it is very much confined to a particular class of practitioners, named CUPPERS, who extract blood in this way with great facility, sometimes to the quantity of a pound in six or seven minutes. Cupping was practised by the ancient Greeks, Romans, and Arabians, and the figure of a cupping-apparatus may be seen in the surgical works of Albucasis; though the methods, formerly in use, were not nearly so convenient and effectual as those employed by the moderns.

When a cupping-glass is applied alone, without scarifying the part, this operation is named dry cupping; and it is had recourse to where we desire to produce a greater flow of blood to a part than is usual, or to draw the milk into women's breasts, or to elongate their nipples, &c. The immediate effect of cupping any part is, to remove the superincumbent weight of the atmosphere upon it, and thereby to occasion a relatively greater degree of pressure on the adjacent parts. The blood is thus urged into the small arteries and veins, so as to produce a considerable redness under the cupping-glass, at which place the skin is also much elevated, and rather inflamed.

The exhaustion of the air from the cupping-glass is generally effected either by an air pump, or by the flame of a wax taper; but the latter mode is now commonly preferred, and is much the most expeditious method. When blood is to be drawn, we first use the glass, and apply the scarificators immediately after its removal; then again fix the glass on the same spot, and leave it there till the blood has flowed freely. To remove the glass, it is only necessary to raise one edge of it a little, so as to admit the air; and after every removal, the skin should be wiped clean with a sponge and

warm

warm water, to keep the scarified surface in a fit state for a renewal of the bleeding. If more than six or eight ounces of blood be intended to be extracted, several glasses, and as many scarifications, will be required; and the depth of the punctures must be in proportion to the quantity of blood demanded, unless the structure of the part forbids our making any other than very superficial wounds. No other dressing is required after cupping, than a piece of fine old linen.

CUPPING-Glass, is a vessel formed somewhat like a bell, applied to several parts of the body, in performing the operation above described. Among the ancients this instrument was composed of horn, wood, brass, silver, &c. When a cupping glass is to be used with an air-pump, for exhaulting it, a small aperture is left in its upper part, which is covered with a valve; but when the air is to be excluded by the flame of a lamp, &c. it must be entire at its upper part, and open at the bottom only.

CUPPIS, in *Geography*, a town of Sweden, in the province of Finland.

CUPRÆ, or **CUPPA**, in *Ancient Geography*, a maritime town of Italy, in the Picenum. Ptolemy places it between Tronto and Matrinum. It is thought to be the present St. Benedetto. Ptolemy also points out another town of this name, in the interior of Picenum, on the mountains beyond Tronto; supposed to be the present Loretto.

CUPRESSETUM, a place of Asia, in Assyria, near the river Caper, according to Strabo.

CUPRESSO-PINULUS, in *Botany*, Breyn. See **BRUNIA nodiflora**.

CUPRESSUS, (*κυπαρίστος*, Theophrast.; *κυπαρισσος*, Diosc.; from *κυσ*, *pario*, and *παρισος*, *æqualis*, alluding to the regularity of its branches. Cupressus; Plin. Cyparifus; Virg.) Cypress, Tourn. 358. Linn. gen. 1079. Schreb. 1458. Willd. 1713. Gært. 569. Juss. 413. Vent. 3. 580. Class and order, *monœcia monadelphica*. Nat. Ord. *Coniferae*; Linn. Juss.

Gen. Ch. Male flowers about twenty, disposed in an egg-shaped catkin. *Cal.* Scale roundish, acuminate, concave, pedicelled, peltate. *Cor.* none. *Stam.* Filaments none; anthers two or four, oval-roundish, one-celled, adnate to the base of the inner side of the scale. Female flowers from eight to ten, clustered into a small, short cone. *Cal.* Scale egg-shaped, thickish, spreading. *Cor.* none. *Pist.* Scarcely discernible; but at the base of each scale there are several points which appear to be germs, with simple or double sessile stigmas. *Peric.* A strobile; scales thickened, at first shut, afterwards expanding, orbicular, angular, generally peltate, convex and almost pointed on the outside; a little concave within, appearing like the heads of nails. *Seeds* several, small, oblong, angular.

Eff. Ch. Males. Catkin imbricated. Calyx a scale. Corolla none. Anthers two or four, sessile, without filaments. Females. Catkin strobilaceous. Calyx a scale. Corolla none. Stigma one or two concave points. Nut angular.

* *Leaves adnate, imbricated on the small branches.*

1. *C. sempervirens*. Common cypress. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. "Leaves imbricated; fronds quadrangular;" Linn. "Little branches quadrangular; leaves imbricated in four rows, obtuse, adpressed, convex; strobiles globular; scales awnless; branches stiff and straight;" Willd. z. Stricta; Hort. Kew. Pyramidal common cypress. Cupressus; Bauh. Pin. 488. *C. meta* in fastigium convoluta, quæ femina Plinii; Tourn. 587. Gært. tab. 91. fig. 1. Lam. Ill. Pl. 787. fig. 1. β . Horizontalis. Hort. Kew. Spreading common cypress. *C. ramos extra se spargens*, quæ mas Plinii; Tourn. 587. The pyramidal

variety is a large ever-green tree, very straight, with a brown bark; the wood hard, compact, pale or reddish, with deep veins, of a penetrating pleasant smell, and very durable; branches almost from the bottom of the stem, upright, and forming a pyramid, in the manner of the Lombardy poplar, so close as to be impenetrable to the rays of the sun. *Leaves* small, opposite, entirely covering the young branches; more distinct on the older ones, where they appear in pairs, decurrent, and clasping the stem; green, smooth, a little pointed, permanent, changing into a kind of scales on the oldest branches, where they become dry, and are partly united with the bark. The colour of these leaves in winter is of a dull sombre cast; but in spring they assume a brighter hue, and give a lively appearance to the tree, even before the expansion of the new leaves. *Flowers* on trees that are at least ten or twelve years old; male catkins from the end of the last year's branches, small, yellowish, three lines long, often very numerous; female catkins much fewer; generally at the end of the branches which spring from wood two years old. *Fruit* strobile, (Galbanus; Gært.; the name given by the ancients to the fruit of the cypress; but it does not at all differ from a strobile, as the term is used by modern botanists, and applied to the fruit of other coniferous plants) ovate-globular, an inch in diameter, not ripening till the following spring; scales large, angular, peltate, corky, slightly convex on the outside, radiately striated, mucronate in the centre, supported on the inner side by a thick angular peduncle; nuts four or more, adhering to the lower part of the peduncle, small, bony, but easily cut with a knife, inversely egg-shaped, compressed, or irregularly angular, covered with a dun-coloured membranous skin, which is extended into a very narrow rim surrounding the nut, one-celled. *Seed* linear-oblong, somewhat cylindrical, of a bay colour. The spreading variety is distinguished at once by its habit, and is so strikingly different from the pyramidal one, that La Marck would pronounce it a distinct species without hesitation, if both kinds were not said to be produced indiscriminately from the same seeds. Miller, indeed, asserts that his horizontal cypress is perpetuated from seeds without variation, and is distinguished from the spreading variety of the common cypress by having its branches more exactly horizontal; but La Marck asserts that this plant, if really a distinct species, is little known to botanists. If, as appears probable, it be *C. horizontalis* of the Hortus Kewensis, it is considered by the very able writer of that work as only a variety of *C. sempervirens*. Linnæus calls the young shoots which bear the fructification *frondes*; and has been followed in this respect by the author of Hortus Kewensis, as well as by La Marck, who calls them in French *feuillaisons*, a word which seems to have been invented by himself for the purpose. Linnæus was probably induced to employ the term in the present instance by the remarkable adnate insertion of the leaves, which appears to incorporate them with the branch; but Willdenow is more correct in calling them what they really are, little branches (*ramuli*); the term *frons* being, as Dr. Smith observes in his "Introduction to Botany," properly confined to the plants of the class cryptogamia. A native of the south of Italy, the Levant, some parts of the Russian empire, China, &c. and cultivated as an ornamental plant in all the warmer parts of Europe, particularly about palaces; no other tree being thought to blend so well with stone buildings. It is not uncommon about Marseilles, Rome, &c.; and is said to be so long-lived, that, if we may believe Pliny, there were in his time trees growing at Rome which were more ancient than the city itself. We are told, that the gates of St. Peter's church at Rome, made of cypress-wood, had lasted from the time of Con-

CUPRESSUS.

stantine, 1100 years, as fresh as new, when pope Eugenius IV. ordered gates of brass in their stead. Some maintain that the wood, *gophir*, of which Noah's ARK was made, was cypress; and Plato preferred it to brass itself, for writing his laws upon it. On account of the gloomy hue of its leaves, especially in winter, it was esteemed by the ancients a suitable ornament of their burial places, was sacred to Pluto and Proserpine, and was used at the funerals of persons of fashion. Hence, with the poets, it obtained the epithets *atra*, *funesta*, *funebria*, and *feralis*. It was introduced into England more than two hundred and fifty years ago, according to Turner, and is still found in old gardens. It has been strongly recommended by Evelyn and Miller, as worthy of more general cultivation in this country, for the sake of the valuable qualities of its timber, which would as soon come to perfection, and prove as profitable as that of the oak. Evelyn praises it for its hardness; but professor Martyn observes, that it has never been planted in any considerable quantity among us, evidently because it cannot resist the attacks of our winter frosts and spring blasts. Its wood, having a pleasant smell, taking a fine polish, and not being liable to be eaten by insects, is esteemed for cabinet furniture and other similar purposes. It was used by the Greeks, in the time of Thucydides, for the coffins of their eminent warriors; and many of the chests which enclose the Egyptian mummies are made of it, affording a decisive proof of its almost incorruptible nature. 2. *C. glauca*. Glauca or Portugal cypress. Lam. 2. (*C. lusitanica*; Willd. 2. Tourn. 587. Duham. Arb. 1. 198. Mill. Dict. *C. pendula*; Mart. 5. L'Herit. Stirp. 15. tab. 8. Hort. Kew. 3. 373.) "Leaves acute, glaucous, glandular, imbricated in four rows; branches hanging down." Lam. "Little branches quadrangular; leaves imbricated in four rows, adpressed, glaucous, keeled; strobiles somewhat globular; branches pendulous." Willd. "A small tree, known at first sight by its glaucous foliage and pendulous branches. *Leaves* small, lanceolate, acute, adnate in their lower part, opposite, with a gland, or rather resiniferous hollow on the back; those on the lower branches in somewhat distant pairs, dryish, rusted, and rather prickly. *Flowers* similar to those of the preceding species, but smaller; male catkins smaller and more obtuse. *Cones* about the size of a common cherry, blueish before they become dry. *Seeds* short, almost orbicular, compressed, angular. A native of the East Indies, on the coast of Malabar; but has been long naturalized in Portugal, where it grows to a considerable timber-tree, though in England it is not more than fifteen feet high. It has been cultivated here more than a hundred years; but being rather tender, is now a rare plant in our gardens and plantations. 3. *C. pendula*. Lam. 4. Willd. 4. Thunb. Jap. 265. (Finora; Kämpf. Amœn. 883.) "Leaves opposite, egg-shaped; little branches dichotomous, pendulous." A tree not more than six feet high, erect, and entirely smooth. *Branches* alternate, lax, leafless, very compound; little branches biliform, covered with leaves, long, lax, spreading, altogether pendulous. *Leaves* decussated, imbricated, egg-shaped, with a point at the end which bends a little outwards, very short. Observed by Thunberg, but without fructification, on the mountains of Japan. 4. *C. thyoides*. White cedar, or arbor vitæ leaved cypress. Linn. Sp. Pl. 2. Mart. 3. Lam. 3. Willd. 5. (*C. uana maritima*; Pluk. Mant. 61. tab. 345. fig. 1.) "Leaves imbricated; fronds two-edged." Linn. "Leaves imbricated, close pressed, with a single gland on the back; fronds flattened, turned different ways." Lam. "A small or middle sized ever-green tree, naturally forming a regular elegant head. *Branches* not pendulous; little branches flattened,

not placed in the same plane as in the arbor vitæ, but standing two ways. *Leaves* of a delicate green colour, small, opposite, imbricated in four rows on the little branches, with their point close to the branch. *Flowers* of the male catkin, according to L'Heritier, with pedicelled, not peltate scales, and only two anthers; of the females, with two stigmas. A native of North America, China, and Cochinchina. In the English gardens it seldom rises much higher than fifteen feet. Loureiro rates that in China it is not more than eight feet high; but in North America it is considerably larger, and is used for posts and rails, but does not last in the ground so well as what is there called red cedar (*Juniperus Virginiana*). Canoes and even houses are made of it; but it is most esteemed for shingles. It was first introduced into England by Peter Collinson, in 1736. 5. *C. columnaris*. Mart. 7. Forst. Flor. Austr. n. 351. "Leaves imbricated, awl-shaped, furrowed; strobiles cylindrical, elongated." A native of New Caledonia and Norfolk island.

** *Leaves free, detached, more or less open, not imbricated.*

6. *C. juniperoides*. African or Cape cypress. Linn. Sp. Pl. 4. Mart. 4. Lam. 5. Willd. 7. "Leaves opposite, decussated, awl-shaped, spreading." *Branches* loose, spreading. *Leaves* near an inch long, of a light green colour, continuing in verdure all the year. *Cones* black when ripe. A native of the Cape of Good Hope. 7. *C. japonica*. Linn. jun. Supp. 401. Mart. 6. Lam. 6. Willd. 6. Thunb. Jap. 265. Gært. tab. 91. fig. 5. Lam. Ill. Pl. 787. fig. 2. "Leaves in four rows, sickle-shaped, compressed, furrowed, decurrent." Thunb. A very lofty, straight tree. *Leaves* resembling those of the spruce fir, or rather those of yew, larger than in the other species, in three or four rows, not opposite, numerous, linear, acute, bent inwards, with four longitudinal furrows, green and somewhat shining above, marked with two whitish streaks underneath, an inch and half long, and little more than a line broad. *Male catkins* several together in a terminal spike, with intermediate leaves, egg-shaped, obtuse, smooth. *Female strobiles* solitary, few, globular, on the lower branches; scales peltate, coriaceous-membranous; variously angular below; cleft above into three or four membranous lanceolate-acuminate, erect segments; the anterior part finally extended into a long, acuminate, keeled, recurved beak; peduncle thick, striated, curved. *Nuts* four or six in each scale, united in pairs, inversely egg-shaped, lenticularly compressed or angular, surrounded with a very narrow membranous edge. *Seed* somewhat cylindrical, black. The wood is soft, and yields readily to the tool; on which account it is much used for cabinets, and other furniture, that are varnished or japanned. If it be kept some time under ground, and then macerated with water, it takes a blueish colour. 8. *C. disticha*. Deciduous cypress. Linn. Sp. Pl. 2. Mart. 2. Lam. 7. Willd. 3. (*C. americana*; Catc. Car. 1. 11. tab. 11. *C. virginiana*, *foiis acacie deciduis*; Comm. Hort. 1. 113. tab. 59. Duham. Arb. 1. 198. tab. 82. Pluk. Alm. 125. tab. 85. fig. 6.) "Leaves in two rows, spreading." Linn. "Leaves linear, in two rows, deciduous, spreading." Lam. One of the largest trees in North America, sometimes seventy feet high, thirty feet in circumference at the surface of the ground, and twenty at the height of six feet. *Branches* extending almost horizontally. *Leaves* acute, in two rows, and very near together on the little branches, whence they have been compared to the leaves of acacia by some of the older botanists, who mistook the little branches for common petioles, and thought the leaves winged; whereas they are strictly simple, about half an inch long, flat, slightly curved, and of a lively green colour, appearing towards the end of

May,

May, and falling off about the middle of November, previous to which they become red. *Cones* larger, with stronger scales than those of the common cypress. *Seeds* also larger, very angular, shining, exuding drops of red, transparent, penetrating resin. A native of North America, where it grows naturally on ground covered with water three or four feet deep, and is one of the few resinous trees which flourish in such situations. As it is hardy, and endures the cold of our climate, it would probably be planted to advantage in marshes on a large scale. Its wood is light, fine-grained, and very durable, whence it is much used in North America for various kinds of carpentry work, and is particularly excellent for shingles. It was introduced into this country by John Tradescant, senior, before the year 1640, but has not become common. La Marek saw, at Monceau in France, on an estate formerly belonging to M. Duhamel, a beautiful villa of these trees in very moist ground, on each side of a small stream, some of which began to bear fruit in 1779. There is a variety in which the leaves are less spreading, rather remote, somewhat scattered, and scarcely in two rows, which is not so handsome a tree.

CUPRESSUS fructu quadrivalvi; Shaw. See THUJAN *articulata*.

CUPRESSUS, in *Gardening*, comprehends plants of the ever-green and deciduous ornamental tree kind; of which the species chiefly cultivated are the ever-green cypress (*C. sempervirens*), the deciduous cypress tree (*C. disticha*), the white cedar or arbor vitæ leaved cypress (*C. thyoides*), the Portugal cypress (*C. penulula*); and the fir has been distinguished into the upright and horizontal or spreading kinds.

Method of Culture.—These plants, in all the different sorts, may be raised either from seeds or by cuttings of the young shoots; but those procured from the seeds are by much the best plants in general.

In the first of these methods, the seed, being provided and obtained from the cones, by exposing them to a moderate degree of heat, should be sown towards the latter end of March, or beginning of the following month, on a warm bed or border, where the soil is rather light and mellow, and has been rendered fine by being well dug over, covering it in, to the depth of about half an inch. When the season proves dry, slight waterings should be occasionally given; and, during the summer, the plants be kept free from weeds, and be watered a little when the weather is hot. In the winter time they should be protected from frosts, by mats, or other contrivances. They must be continued under this management till they have attained two years' growth, when they may be removed in the beginning of the spring, and planted in nursery rows, in a warm situation, at the distance of eighteen inches or two feet, and eight inches or a foot apart. When they have had three or four years' growth in these rows, they will be in proper condition for being finally set out where they are to remain. The best time for performing this business is in the beginning of spring, when the season is fine.

They are capable, however, of being raised in a more expeditious manner, by sowing the seeds in pots or tubs of light earth, and plunging them in a moderate hot-bed; as in this way they will be fit for removing into nursery rows, in the course of twelve months, or a little longer.

But as seed of this sort is slow in vegetating, this last method is the most proper for it, as shade may be more conveniently provided during the summer months, and protection in a sunny exposure in the winter; and when the plants do not appear in the course of the first year, the aid of a hot-bed may be conveniently had in the following spring, by which they will be brought forward with expedition to the state proper for being planted out in nursery-rows.

And in the second mode, the cuttings made from the young shoots should be planted in a warm sheltered situation, either in the early autumn or spring months; care being taken to have them daily supplied with water in the following summer. Afterwards the plants should be managed in the same manner as these raised from seed.

This method may be attempted with all the sorts; but those of the ever-green kind are extremely slow in striking root.

The plants raised in this way are likewise much slower in their growth than those which are produced from seeds.

In their general culture, these plants should always be suffered to take their natural growth, without clipping or cutting them.

All these sorts, from their beautiful growth and closely-placed foliage, have a very ornamental effect in the fronts of large plantations, as well as in groups, with other trees, on the sides of lawns, or other parts of pleasure-grounds. They have likewise a fine appearance in clumps, or planted out singly; and also in groups of from three or four to eight or ten of the different kinds, introduced where the extent of mown-grass ground is considerable.

And the ever-green sorts, from their beautiful pyramidal growth, produce an agreeable variety, in assemblage with other sorts of plants, when planted near ornamental or other buildings of that description.

The large tree growing sorts may likewise be introduced with great effect, in the front parts of plantations of timber trees.

CUPRUM. See COPPER.

CUQ-TOULZA, in *Geography*, a small town of France, in the department of the Tarn, chief place of a canton, in the district of Lavaur, with 1002 inhabitants. The canton has 10 communes, and 4904 inhabitants, on a territorial extent of 117½ kilometres.

CUQUENI, or *CUCUENI*, in *Ancient Geography*, a people of Gallia Aquitania, according to Ptolemy.

CURA AVENACEA, a diet-drink of oats, much recommended by some authors in various distempers.

CURAÇAO, or *CURAZAO*, in *Geography*, an island in the Caribbean sea, about 50 or 60 miles from the continent, 9 or 10 leagues in length, and about 4 in breadth, formerly belonging to the Dutch, who took it from the Spaniards in 1632, but captured by the English in January, 1807. The soil of this island is naturally barren, and the climate is far from being salubrious; but the Dutch, by their indefatigable industry, have converted the pastures, which formerly furnished a great number of cattle, into plantations for sugar and tobacco, and rendered it, in a variety of respects, productive. It has good salt-works, which afford a considerable supply of this article to the English islands and the colonies on the continent. This island has been rendered peculiarly advantageous to the Dutch, by the contraband trade, which is carried on between the inhabitants and the Spaniards, and by its harbour's being the rendezvous to all nations in time of war. The Dutch ships from Europe have been accustomed to touch at this island for intelligence, or pilots, and then to proceed to the coast of the Spanish main for trade; in addition to which, there is a constant intercourse between Curaçao and the Spanish continent. In the island are numerous warehouses, full of the commodities of Europe and the East Indies; consisting of all sorts of woollen and linen cloth, laces, silks, ribbands, iron utensils, naval and military stores, brandy, the spices of the Moluccas, and the calicoes of India, white and printed. One of the principal advantages derived by the Dutch from this island is owing to their trade in African slaves; three or four cargoes of whom have been annually

brought hither, for the supply of Carthagea, Porto Bello, and other towns on the continent of America. These they sell at a high price, and with them they vend all the kinds of goods above enumerated. The Spaniards pay in gold or silver, coined or in bars, cocoa, vanilla, Jesuits' bark, cochineal, and other valuable commodities. The trade of this island, in times of peace, is said to be annually worth to the Dutch no less than half a million sterling; but in time of war, it is much greater; for it then becomes the common emporium of the West Indies. The French resort hither to buy beef, pork, corn, flour, and lumber, which are brought from the continent of North America, or exported from Ireland: so that, in peace or war, the trade of this island has been rendered very flourishing and lucrative to the Dutch. On the south side of the east end of the island is a harbour, called Santa Barbara; but the chief harbour is at the distance of about 3 leagues, where the Dutch have a very good town, and a strong fort. The town is one of the largest and finest in the West Indies; the public buildings are numerous and handsome; the private houses commodious; and the magazines large, convenient, and well stored. N. lat. between 12° and 15°. W. long. between 60° and 70°.

CURACAO, in *Ichthyology*, a species of *Chatodon*; which see.

CURAPONNA, in *Ancient Geography*, a town of India, on this side of the Ganges. Ptolemy.

CURARAY, in *Geography*, a river of South America, which runs into the river of the Amazons.

CURASSAW, CRYING, in *Ornithology*, the PENELOPE *vociferans* of Gmelin; which see.

CURASSO, or CURASSOW. See CRAX.

CURATAS. See CAZIC.

CURATE is properly a parson, or vicar of a parish, who hath the charge or cure of the parishioners' souls.

CURATE is now more generally used for a deputy, or substitute of the parson; or one who officiates in the place of the incumbent, or beneficiary. And in case of plurality of livings, or where a clergyman is old and infirm, it is requisite there should be a curate to perform the cure of the church. He is to be licensed and admitted by the bishop of the diocese, or by an ordinary, having episcopal jurisdiction; and when a curate hath the approbation of the bishop, he usually appoints the salary too; and in such case, if he be not paid, the curate hath a proper remedy in the ecclesiastical court, by a sequestration of the profits of the benefice: but if he hath no licence from the bishop, or hath no such salary appointed, or hath made a special agreement with the rector, he is put to his remedy at common law, where he must prove such special agreement, or leave it to a jury to give damages upon a *quantum meruit*. (*Rights of Clergy*, 127.) By stat. 28 Hen. VIII. c. 11. those who serve a church, during its vacancy, shall be paid such stipend as the ordinary thinks reasonable, out of the profits of the vacancy; or, if that be not sufficient, by the successor, within fourteen days after he takes possession. By stat. 12 Anne, st. 2. c. 12. where curates are licensed by the bishop, they are to be appointed by him a stipend not exceeding 50*l.* nor less than 20*l. per annum*, according to the value of the livings; to be paid by the rector or vicar: and the same may be done, on any complaint made; and on failure of payment, they may sequester the profits of the benefice. But by stat. 36 Geo. III. c. 83. the bishop or ordinary may appoint a stipend to curates of 75*l. per annum*, on livings where the rector or vicar does not personally reside four months in the year at least, together with the use of the rectory or vicarage-house, and the garden and stable belonging to it, or 15*l. per annum* in lieu of it: the grant of the house, however, may be revoked; and the curate is required peaceably

to surrender the possession of it, under a penalty of forfeiting to the rector or vicar all such parts of his stipend as shall then be unpaid, or thereafter become due; and also the sum of 50*l.* to such rector or vicar, recoverable in an action of debt. By the same statute it is enacted, that churches augmented by queen Anne's bounty shall be deemed benefices presentative; and the officiating curate shall have the same stipend, under similar regulations, as in the former case. It is further enacted, that the bishop or ordinary may apportion the stipend to officiating curates of perpetual curacies that are not augmented: and the ordinary may license curates employed, though no nomination shall have been made to him by the incumbent, and may revoke any licence, subject to appeal to an archbishop of the province.

By a bill now (May, 1808) before parliament, it is proposed to be enacted, that where spiritual persons shall be non-resident, the bishop shall assign to the curate a stipend, which, with any former stipend payable in respect of such cure, shall not exceed one-fifth of the annual value of the benefice, &c. if the annual value shall exceed 400*l.* clear of all expences, the payment of such curate excepted; and, in case of neglect on the part of the spiritual person to nominate a fit curate, the bishop may appoint one, assign him his stipend, together with a residence in the parsonage or vicarage house, or in lieu of it a sum not exceeding 30*l.* a year. But the stipend to be assigned to any curate shall in no case exceed 250*l. per annum*, unless with the consent of the incumbent. The bishop in certain cases may nominate more than one curate and allow them stipends. The incumbent is required to deliver a statement of the annual value of his benefice, on which the bishop shall adjudge the stipend with regard to benefices, &c.: under 400*l.* a year, the regulations of the statute 36 Geo. III. continue in force.

One person cannot be curate in two churches, unless such may satisfy the law, by reading both morning and evening prayers at each place: nor can he serve one cure on one Sunday, and another cure on the next; for he must not neglect to read morning and evening prayers in his church every Lord's day: if he doth, he is liable to punishment. (*Comp. Incumb.* 572.) But it is otherwise where a church or chapel is a member of the parish church; and where one church is not able to maintain a curate. (*Can.* 48.) A curate, having no fixed estate in his curacy, not being instituted and inducted, may be removed at pleasure by the bishop or incumbent. (*Nov.*) But there are perpetual curates as well as temporary, who are appointed where tythes are impropriate, and no vicarage endowed. These are not removeable, and the impropriators are obliged to find them, some whereof have certain portions of the tythes settled on them. *Stat.* 29 Car. II. c. 8.

It was provided in 1693 by can. 33. that if a bishop ordain any person, not provided with some ecclesiastical preferment, except a fellow or chaplain of a college, or a master of arts of five years standing, who lives in the university at his own expence, the bishop shall support him till he prefer him to a living. The bishops, before they confer orders, require either proof of such a title as is described by the canon, or a certificate from some rector or vicar, promising to employ the candidate for orders *bona fide* as a curate, and to grant him a certain allowance till he obtains some ecclesiastical preferment, or shall be removed for some fault. No curate, or minister, ought to perform the duties of any church, before he has obtained a licence from the bishop. The bishop cannot increase the salary of the curate, if there be a specific agreement between the incumbent and the curate. (*Freem.* 70.) Curates must subscribe the declaration, according to the act of uniformity, or are liable to imprisonment, &c.

CURATELLA, in *Botany*, Linn. Gen. 679. Schreb. 921. Willd. 1056. Juss. 282. Class and order, *polyandria digynia*. Nat. Ord. *Magnolia?* Juss.

Gen. Ch. *Cal.* Perianth expanding, hairy on the outside, deeply divided into four or five rounded segments; in the former case, two larger than the others; in the latter, only one. *Cor.* Petals four or five, roundish, concave, attached to the receptacle by a short claw. *Stam.* Filaments about sixty, in several rows, a little shorter than the petals; anthers egg-shaped. *Pist.* Germs two, superior, hairy, connate at the base; styles simple; stigmas capitate. *Peric.* Capsules two, united at the base, somewhat fleshy, roundish, hairy, one-celled, two-valved, opening on the interior side. *Seed.* in pairs, oblong, shining, brown. La Marck, from a dried specimen in flower.

Ess. Ch. Calyx deeply divided into four or five segments. Petals four or five. Styles two. Capsules two, united at the base, one-celled. Seeds two in each capsule.

Sp. C. *americana*. Aubl. Guian. 1. 579. tab. 232. Lam. Ill. Pl. 479. Leaf. It. 260. A tree with the habit of coccoloba. Trunk seven or eight feet high, from eight to ten inches in diameter, crooked; with a thick, wrinkled, cracked bark, which falls off in pieces of various sizes; wood reddish, compact; branches crooked, rugged. Leaves alternate, large, almost sessile, oval or oval-oblong, edged with large shallow crenatures, green, very rough, furnished underneath with lateral prominent nerves and intermediate reticular veins. Flowers in compound racemes, situated below the leaves, on the naked parts of the branches, and from the axils of the leaves which have already fallen; white, numerous, with two narrow acute bracts at the foot of each peduncle, and at each ramification of the raceme. A native of South America, in Guiana, &c.

CURATIVE INDICATION, among *Physicians*, that which directs what is to be done for the cure of a disease. See **SYMPTOM**, and **INDICATION**.

CURATOR, among the Romans, an officer under the emperors, who regulated the price of all kinds of merchandize and vendible commodities in the cities of the empire.

They had likewise the superintendence of the customs and tributes; whence also they were called *logijla*.

CURATOR, in *Civil Law*, a trustee, or person nominated to take care of the affairs and interests of a person emancipated, or interdicted.

In countries where the Roman law prevails, between the age of fourteen and twenty-four years, minors have curators assigned them; till fourteen, they have tutors.

CURATOR of an University, in the United Provinces, is an elective office, to which belongs the direction of the affairs of the university; as, the administration of the revenues, the inspection of the professors, &c.

The curators are chosen by the states of each province: the university of Leyden has three; the burghermasters of the city have a fourth.

CURB, in the *Manege*, the designation given by horsemen to the *bit*, or mouth piece, that is provided with a branch and chain. See art. **BITTS**. *Kirble* was the ancient word, and *kih* should, we apprehend, be the proper mode of spelling it now where any restraint is signified; on the contrary, where any curvature or inflexion is intended, the present is the proper mode of spelling it, as in the following article, for they appear to us of different origins and meanings, and from different languages, and ought not to be confounded as they are at present.

CURB, a disease of the lower part of the hock of the horse, derived from *course*, French, and *curvus*, Latin,

distorted or bent from their proper figure. The back part of the hock of the horse, seen in profile, is nearly straight or a little bending inwards, that is, from the point of the os calcis to the head of the mesocynium, or shank where the disease appears. If the hock be exerted beyond its strength, this part is apt to swell and form a curved line outwards, or rather backwards, more or less elevated according to the injury sustained. The advantageous purchase of the gastrocnemii muscles upon the os calcis seems to be the principal cause of this mischief, the parts being unable in violent and sudden action to sustain their effect, though the tendons of this part are singularly wrapped round and strengthened, obviously to enable them to sustain these shocks, by the flattened or sheath-like expansion of the perforatus tendon. In leaping, violent riding, in hunting, drawing, and especially in the military charges of the cavalry, where they are suddenly stopped at full gallop, and often with injudicious and unnecessary suddenness, and without previous preparation, the horses are thrown on their haunches, and thus continually get diseased in this part, and often totally ruined. Nothing but imperious necessity, or the actual combat, one should suppose, could justify the frequent repetition of such a dangerous manœuvre; much depends, however, upon the hand of the rider, in not making it injurious, as a very slight preparation or warning given to the horse is sufficient. These curbs often grow hard, lose all the active inflammation which attends their first production, and seem hardly to affect the horse's going; at other times they are attended with considerable tenderness and lameness, and it most frequently happens, that the other parts of the hock suffer at the same time, and spavin very frequently, and sometimes thorough pain, accompany it.

After the gastrocnemii muscles have attached their tendon strongly to the os calcis, they appear to send portions for a second attachment to the head of the shank, and there it is the injury is sustained.

In recent cases the cold bathing of the parts is the best remedy, and rest till the inflammation is subdued, with a dose or two of physic if there is occasion; in more confirmed cases blistering, or in more desperate cases firing, is the best remedy: a straight line in this case is drawn by the iron down the back of the calcis and head of the shank, feathered on each side by diagonal lines at proper distances; and as the inside of the hock is apt to partake of the mischief, it may be well to draw a straight line down its middle, forming an angle to the former opening upwards, and closing pretty much as the figure of the hock itself does, the diagonal lines from this meet the diagonal lines from the former line, forming with them a double feathered figure: the same also may be done to the outside, if the case shall appear to demand it.

CURCAS, in *Botany*, a name given in Egypt to an esculent root, approaching to the taste and virtues of the *colocasia*.

It is also a name used in Malabar for a small fruit of the shape and size of a hazel nut. Both these things have the credit of being great provocatives; and it is very probable, that the curcas of the East Indies may be the fruit called *lel* by Avicenna, and said to possess the same famous virtues. Garcias has been led into a very great error by this similarity of names and virtues, and supposes the curcas of Egypt the same with the curcas of the East Indies.

CURCO, in *Geography*, a town of Asiatic Turkey, in the province of Caramania; 35 miles S.W. of Tarsus.

CURCULIGO, in *Botany*, (from *Curculio*, one of the coleopterous insects.) Gært. 72. Mart. Class and order, *hexandria monogynia*.

Gen. Ch. *Cal.* none. *Cor.* petals six, oblong, spreading,

ing, withering. *Stam.* Filaments six, very short; anthers linear, erect. *Pyl.* Germ sessile, lanceolate; style very short; stigma large, tapering, with a three-cleft tip. *Peric.* Capsule, when immature, three-celled, with the rudiments of six or eight seeds in each cell; finally appearing one-celled. *Seeds* one to four, shining, black, with a horny, somewhat incurved beak resembling the rostrum of a curculio.

Eff. Ch. Calyx none. Corolla six-petalled. Filaments six. Pistil one. Pericarp a capsule. Seeds beaked.

Sp. C. orchinoides. Mart. *Gært.* tab. 16. fig. 11. Plant. *Coromand.* 14. tab. 13. *Root* tuberous, with many fleshy vermicular fibres. *Leaves* numerous, all radical, petioled, sword-shaped, nerved, slender, beset with a few soft white hairs when young, from six to eighteen inches long, half or three quarters of an inch broad; petiole channelled, sheath-shaped below, and embracing the inner ones. *Raceme* solitary, axillary, two-ranked, its top just appearing above the earth; scape about an inch long, compressed, clubbed; lower bractes remote, upper ones nearer, spathe-like, pointed, decreasing in length towards the top, so that they become nearly horizontal like a corymb, one-flowered. *Flowers* pretty large, yellow, only one or two of the lowest fertile, the others abortive from the want of a pistil; peduncles so long that they elevate the flower above the earth more than an inch, hairy, three-sided. A native of shady uncultivated places about Samulcotah on the coast of Coromandel, but not common. It is the Nallatady of the Telingas.

CURCULIO, in *Entomology*, a genus of the coleoptera order. The antennæ are clavated or terminated in a club, and feated on the snout, which is horny and prominent; feelers four, and filiform.

The curculioncs, in a state of larva, subsist chiefly on the seeds of various kinds of plants; many of them infest granaries, and commit vast depredations, devouring the ripened cotyledons, and leaving only the husk. The larvæ have six scaly legs, and the head also protected with a scaly covering. The perfect insects are, in general, of an elegant form; and some of the species infinitely more remarkable for the splendour and beauty of their colours, than almost any other of the insect race. The species are very numerous, and are divided into a number of distinct families, or sections. Fabricius divides them into three genera, as curculio, anthribus, and brachycerus. Some other continental naturalists divide them into a still greater number of genera.

Species.

Section 1st. * *Snout longer than the thorax; Thighs unarmed.*

GIGAS. Thorax and wing-cafes scabrous; antennæ white at the tip. Olivier.

Native of Japan. Described from a specimen in the British Museum.

PALMARUM. Deep black; thorax flat above; wing-cafes short, and striated. Linn. *Donov. Inf. Ind.*

Lives on the palm-trees in India.

CRUENTATUS. Black; lines on the thorax, and two dots on the wing-cafes ferruginous. Olivier.

Inhabits Carolina. Bankian Cabinet.

LONGIPES. Blackish; wing-cafes ferruginous; snout emarginate; anterior legs long. *Vdet.*

Inhabits the Cape of Good Hope.

COLOSSUS. Blackish; wing-cafes brown or cinereous; legs elongated. *Ouv.*

An East Indian species, the *curculio longipes* of Drury.

INDUS. Black; thorax subovate, excavate, punctured; wing-cafes with rugged grooves; flanks spinous. Linn.

A species of large size, found in India.

PAGANUS. Greyish; thorax brown on the back, with cinereous curves; snout with two grooves. Fabr.

The snout of this insect is thick, and twice as long as the head; the antennæ grey, with the base black.

A native of India.

FERRUGINEUS. Dull-purplish; wing-cafes abbreviated; thighs ciliated in the middle. Oliv.

Inhabits Brasil. Sulzer.

HEMIPTERUS. Dull-purplish; wing-cafes abbreviated and spotted. Linn. *Curculio rufo-fasciatus*, Degeer.

Native of South America, chiefly Cayenne.

VARIEGATUS. Rufous and black varied; snout at the tip black. Olivier.

From the Cape of Good Hope.

LIMBATUS. Blackish; thorax, and wing-cafes at the margin rufous.

Described by Olivier as a native of Senegal.

CRUCIATUS. Black; thorax sub-spinous; lines on the posterior end of the wing-cafes cruciform. Fabr.

A New Holland species, in the Bankian Cabinet.

SANGUINOLENTUS. Deep black; wing-cafes marked with a sanguineous band at the base. Oliv.

Inhabits the American island Tobago.

FASCIATUS. Deep black; wing-cafes striated, with a sanguineous band in the middle. Fabr.

STRIATUS. Black; wing-cafes marked with silky stripes. *Curculio striatulus*, Oliv.

Described from a specimen in the Bankian cabinet. Found in the island of Terre Neuve.

RUBETRA. Deep black; antennæ griseous; thighs fulcated. Fabr. *Curculio gagates*, Oliv.

Native of Cayenne.

GAGATES. Deep black, and glabrous; snout somewhat compressed. Fabr.

Inhabits Cayenne.

MENDICUS. Ovate, greyish; wing-cafes striated. Oliv.

Described from a specimen in the cabinet of the late king of France. It is a native of the island of Madagascar.

PINETI. Black; wing-cafes striated, and spotted with white. *Curculio confusus*, Paykull.

Found on the pine in Sweden.

PINI. Wing-cafes reddish, with clouded bands. Linn. *Curculio castaneus*, Degeer.

Also inhabits the pine in Sweden.

ONOPORDI. Black, with cinereous hairs; snout deep black, with an abbreviated groove on each side at the base.

Native of Africa.

URBUS. Ferruginous-brown, lineated with white; snout black, with an abbreviated groove each side at the base. *Curculio vittatus*, Mant. Inf.

Found in Italy. The snout is cylindrical; wing-cafes smooth.

PLANUS. Black, and without spots; snout cylindrical; wing-cafes striated. Fabr.

Native of Germany.

PUNCTULATUS. Yellow, varied with brown; abdomen cinereous, dotted with black. Fabr.

Inhabits America. The antennæ are black; legs cinereous.

OCULARIS. Greenish-black; snout ferruginous; orbits of the eyes snowy. Fabr.

A native of Barbary, in the museum of M. Desfontaines.

CURCULIO.

CYNARAE. Black, sprinkled with greenish; snout black, and somewhat carinated. *Curculio cardui*, Rossi.

According to Dr. Vahl, a native of Africa.

COLON. Greyish; wing-cafes marked with a white dot. Paykull. *Curculio palustris*, Scop.

Inhabits Germany.

2-MACULATUS. Fuscous, with a cinereous dot on the wing-cafes; snout and legs deep black. Fabr.

Native of Saxony. The snout is curved, and deep black; legs the same colour.

PUNCTUM. Deep black; wing-cafes striated, with a white spot in the middle; antennæ and legs red. Fabr.

Inhabits the same country as the last.

BICUTTATUS. Deep black; wing-cafes with elevated dots; abdomen and posterior legs yellow. Fabr.

From the cabinet of Dr. Hunter. This species inhabits America.

BILINEATUS. Fuscous; two lines and dot on the wing-cafes white. Fabr.

Native of Germany.

SORDIDUS. Dull-black, and without spots; wing-cafes striated. Fabr.

Found in the islands of South America.

SUILLUS. Thorax rough; wing-cafes marked with pilous striæ. Fabr.

Inhabits the same places as the preceding.

TESSELLATUS. Cinereous; white striæ at the tip of the wing-cafes dotted with black. Fabr.

Found in Germany. Hattorf.

ABBREVIATUS. Deep black; thorax flat and dotted; wing-cafes abbreviated, and sub-striated. Fabr.

Inhabits Saxony. Hybner.

NITENS. Deep black and glossy; thorax flat and smooth; wing-cafes striated. Fabr.

Native of the south of France.

EQUISETI. Thorax smooth; wing-cafes muricated and black; two dots, and tip white. Herbst. Arch. *Curculio scaber*, Linn. *Curculio nigro-gibbosus*, Degeer.

Feeds on the *equisetum arvense*, and inhabits England.

DIMIDIATUS. Deep black; wing-cafes somewhat striated and rufous. Oliv.

Native place unknown.

BUFO. Fuscous; wing-cafes sub-reticulated, with a white band in the middle. Oliv.

Described from a Siberian insect in the Bankian cabinet.

ATRIROSTRIS. Cinereous; snout arched, and deep black. Paykull. Monagr.

Found near Leipsic.

BRUNNIROSTRIS. Griseous; snout and legs ferruginous. Fabr.

Inhabits plants in Denmark.

FESTIVUS. Brassy and glossy; an obtuse angle at the base of the wing-cafes; tip of the snout, and the antennæ fuscous. Fabr.

Native of Surinam.

TRAGIÆ. Brassy; snout and legs of the same colour. Oliv.

Discovered among the seeds of the *tragia volubilis*, brought from Brazil. Bankian Cabinet.

AENEUS. Black; wing-cafes brassy. Fabr. *Attelabus cracca*, Panz. *Apion aeneum*, Herbst.

Described as a native of Britain, from a specimen in the collection of Dr. Hunter. Its haunts are unknown.

CURVIROSTRIS. Deep black; wing-cafes brassy. Oliv. The thorax of this species is dotted; and the wing-cafes striated.

A native of New Holland.

AETHIOPS. Deep black; antennæ and shanks pitchy; wing-cafes oblong and striated. Paykull.

Found in Sweden.

SCIRPI. Fuscous; wing-cafes somewhat striated, and sprinkled with ferruginous. Fabr.

Observed on the scirpus, in France, by Bose.

PRUNI. Deep black; antennæ ferruginous; thorax bituberculate. Linn.

Native of Europe.

ARMENIACÆ. Deep black, and immaculate; wing-cafes with crenate striæ. Fabr.

CAMELUS. Fuscous; thorax and wing-cafes tuberculate; snout rufous at the tip. Fabr.

Found in gardens in Germany.

4-TUBERCULATUS. Thorax with four black tubercles; wing-cafes striated and varied with cinereous. *Curculio quadricornis*, Paykull.

Mus. Daldorff; specimen found near Kiel.

TETER. Depressed, villous, and fuscous; snout deep black. Fabr.

Native of Italy.

CAMPANULÆ. Ovate, and black; wing-cafes striated and obtuse. Paykull.

NIGRIROSTRIS. Green, with the snout black. Paykull.

An example of this species found in England is preserved in the Bankian cabinet.

VARIABILIS. Subtestaceous; thorax green lineated; snout at the tip fuscous. Fabr.

Inhabits Hamburg. Dr. Schulz.

PICIROSTRIS. Oblong, black, silvery-silky; snout half-way, and legs piceous. Paykull.

SALICARIÆ. Deep black; base of the antennæ, disk of the body, and the shanks testaceous. Fabr. *Curculio lythri*, Paykull.

Found in England.

FLORALIS. Dull griseous; future of the wing-cafes pale. Paykull.

Taken on flowers in Sweden.

PSEUDACORI. Above black; thorax at the sides ferruginous; wing-cafes striated; future at the base, white. Fabr.

Inhabits France.

CASTOR. Ovate; thorax tuberculate; body striated; future at the base whitish; legs rufous. Fabr.

Native of Germany.

PERICARPIUS. Subglobose, and clouded; wing-cafes on the future at the base, white. Linn.

Found on the scrophularia in Europe. Herbst.

QUERCICOLA. Deep black; thorax tuberculated; wing-cafes striated; future at the base white; legs black. Paykull, Monogr.

Inhabits the oak in Sweden.

ASSIMILIS. Thorax bituberculate, and canaliculate; wing-cafes striated. Paykull, Monogr.

Inhabits Sweden.

SISYMBRII. White and fuscous varied; wing-cafes with an elevated black dot at the base; snout black. Fabr.

A rare species found near Kiel.

CAPRÆ. Wing-cafes with two abbreviated white bands. Fabr.

Inhabits England, on the willow. Donov. Brit. Inf.

BIPUNCTATUS. Villous, cinereous; wing-cafes with a black spot in the middle; shanks yellowish. Linn.

Native of Sweden.

CARPINI. Villous, greenish; snout black; legs testaceous. Knock.

Inhabits Germany.

CURCULIO.

ERYSIMI. Black; thorax bituberculate and greenish; wing-cafes cyaneous. Paykull.

4-MACULATUS. Blackish, wing-cafes marked with four whitish spots. Linn.

Inhabits various places in Europe.

UNIFASCIATUS. Above fuscous; wing-cafes banded in the middle with cinereous. Fabr.

Found in Saxony by Hybner.

BIFASCIATUS. Black; wing-cafes with two cinereous bands, that at the base larger and waved. Fabr.

This species inhabits Germany; the thorax is rounded, and black, with a paler dorsal line; scutel cinereous.

ACRIDULUS. Black; antennæ and legs pitchy; abdomen ovate. Linn.

Frequent on tetradynamic flowers. Herbit.

SCABRATUS. Fuscous; thorax tuberculated; wing-cafes scabrous; legs pitchy. Fabr.

Native of Germany. Smidt.

LAUDA. Above deep black; thorax bituberculate, and elevated at the anterior edge. Fabr. *Curculio elevatus*, Gmel.

Inhabits same country as the last.

DORSALIS. Wing-cafes red; future half-way black. Linn.

Found on the common pilewort, in Europe.

QUERCUS. Cinereous; back of the thorax fuscous; wing-cafes testaceous. Linn.

A small species found on the oak in Germany and Sweden.

SUTURALIS. Ovate and fuscous, with a longitudinal white line. Fabr.

Feeds on the willow. This kind is found in Germany.

CRUX. Deep black; thorax with two dots at the base; wing-cafes at the future, and sprinkled dots white. Schulz.

LEMNÆ. Deep black; snout flat at the tip; wing-cafes striated. Fabr.

Found on the lemna (Duck weed) in Germany. The species is small.

EXCLAMATIONIS. Deep black; wing-cafes with a white dot in the middle, and small white line at the base. Oliv.

Inhabits New Holland; Banksian cabinet.

VENUSTUS. Fuscous; thorax and elytra lineated with white; legs testaceous. Fabr. *Curculio albo vittatus*, Herbit.

Found in England.

PLANTAGINIS. Wing-cafes cinereous, with a fuscous spot in the middle. Paykull.

Inhabits Saxony.

RUMICIS. Griseous, clouded with black; antennæ fuscous. Linn.

Found in the north of Europe.

ADSPERSUS. Griseous; thorax black lineated with cinereous; wing-cafes tessellated with black dots. Fabr.

GRANARIUS. Pitchy; thorax punctured, and as long as the shells. Linn.

This is the weevil insect so destructive to granaries where corn has been kept for some time. It is destroyed by strewing elder or henbane among the corn.

ORYZÆ. Pitchy; thorax dotted, and length of the wing-cafes; the latter with two rufous dots. Linn.

Found in rice imported from the East Indies.

2-TUBERCULATUS. Ferruginous; thorax length of the wing-cafes, with two elevated dorsal dots. Fabr.

Native of New Zealand. In the Banksian cabinet.

PARAPLECTICUS. Cylindrical, and subcinereous; wing-cafes mucronated. Linn. Geoffr.

Found in England but rare.

ANGUINUS. Cylindrical, hoary, lineated with fuscous. Linn.

Inhabits Germany.

STRIATELLUS. Oblong, dull; wing-cafes cinereous, and slightly striated with fuscous. Fabr.

Taken on plants in Barbary.

UMBELLATARUM. Thorax black, with cinereous lines; wing-cafes mucronate and greyish. Fabr.

Found on umbelliferous plants in Barbary.

MUCRONATUS. Cylindrical, cinereous, lineated with fuscous; wing-cafes pointed. Fabr.

Inhabits same country as the preceding.

FERRUGATUS. Black, with ferruginous hair; wing-cafes obtuse. Fabr.

Native of Hungary. Hybner.

GAGES. Deep black, and glossy; wing-cafes striated and dusky; snout truncated. Fabr.

Found in Guinea. Dr. Ifert.

8-LINEATUS. Cylindrical, black; thorax and four lines on the wing-cafes white. Oliv.

Described from a specimen in the royal Paris collection. The species inhabits the Cape of Good Hope.

SEMIUNCTATUS. Cylindrical; thorax with white lines; wing-cafes with white dots. *Curculio semipunctatus*, Oliv.

Brentus semipunctatus. Fabr. Mant.

Native of New Holland. Banksian cabinet.

4-PUSTULATUS. Black; wing-cafes with two ferruginous spots. Oliv.

Inhabits the Cape of Good Hope.

MIXTUS. Cylindrical; clouded white and brown; wing-cafes submucronate; club of the antennæ testaceous. Fabr.

Found in Barbary. Desfontaines.

FILIFORMIS. Cylindrical, subcinereous; three brown lines on the thorax. Fabr.

Native of Italy.

CYLINDRICUS. Cylindrical, above black; wing-cafes cylindrical, with a pale band. Oliv.

Inhabits Siberia.

NOTATUS. Thorax fuscous, with four white dots; wing-cafes fuscous, with two testaceous bands, the anterior one abbreviated. Fabr.

Inhabits Barbary, according to Vall.

BARBIROSTRIS. Black, snout bearded; anterior shanks tridentated. Oliv. Donov. Inf. India.

Inhabits India.

ANGUSTATUS. Cylindrical, deep black; wing-cafes obtuse and punctated. Herbit. *Curculio pulverulentus*, Rossi.

Inhabits England. The thorax is rough; wing-cafes striated with dots.

BARDANÆ. Cylindrical, with grey down; anterior legs elongated. Fabr.

Found in Saxony. The wing-cafes are rounded, and obtuse.

ASCANII. Cylindrical, deep black, beneath bluish. Fabr.

Inhabits the South of Europe.

LINEOLA. Cylindrical, black; wing-cafes marked with a testaceous stripe. Oliv.

Native of New Holland, Banksian cabinet.

LINEARIS. Elongated, black; antennæ and legs pitchy; snout attenuated at the base. Paykull.

Inhabits Europe. Found near Strasburg by Hermann.

CRASSIPES. Anterior thighs subclavated; body deep black. Fabr.

CURCULIO.

Same part of Europe as the foregoing.

ATRIPLICIS. Elongated; deep black, thorax glossy; wing-cafes striated and obtuse. Fabr. *Curculio T. album*, Linn. Fn. Suec.

Found on flowers in Europe.

LYMEXYLON. Elongated, griseous; thorax scabrous; wing-cafes striated. Fabr.

On the rotten trunks of oak trees. Dr. Helwig.

Section 2* *Snout long; Thighs dentated.*

CALCARATUS. Black; wing-cafes sprinkled with fuscous; anterior thighs acutely dentated. Fabr.

The largest in this order of curculiones; the native place is unknown.

BIDENS. Posterior thighs dentated and black; wing-cafes armed with a single spine each. Oliv.

Native of New Zealand.

TAURUS. Greyish; thorax and wing-cafes tuberculated; two bent horns on the snout. Oliv.

Inhabits Cayenne.

CORNUTUS. Thorax tuberculated; snout armed on each side with an acute spine. Oliv.

Native of Cayenne. This is a large insect.

MILIARIS. Fuscous, thorax and wing-cafes rough with numerous tuberculations of deep black. Oliv.

Inhabits same country as the last.

CYANICOLLIS. Oblong, blackish; thorax blue; sides scabrous; wing-cafes striated. Oliv.

A large species, in the collection of Dr. Hunter. Its native place unknown.

JAMAICENSIS. Dull, rough; fasciculate tubercle each side the thorax; wing-cafes striated. Oliv.

Native of South America.

SENEGALENSIS. Wing-cafes tuberculated, and pointed, with two spots of golden down. Fabr.

Inhabits Senegal. Paykull.

VALIDUS. Anterior thighs dentated, oblong, rough and black; anterior shanks dentated. Oliv.

Native of Cayenne.

CORONATUS. Black; anterior part of the thorax ciliated with spines; wing-cafes striated. Oliv.

MUCROREUS. Four anterior thighs dentated; wing-cafes covered with yellowish powder, above the tip gibbous. Linn.

Native of the East Indies.

PUSIO. Four posterior thighs dentated; wing-cafes striated, black, with broad repandate grey line. Linn.

An East Indian species.

SPINIPES. Black, two lines on the thorax, and four on the wing-cafes white; anterior shanks spinous. Fabr.

From the Hunterian cabinet; a native of South America.

BOMBINA. Ferruginous fuscous; wing-cafes striated, and beset with white raised tubercles. Fabr.

Native of Cayenne.

SCORPIO. Deep black; thorax flat, at the base cinereous; wing-cafes tuberculated, and pointed, middle cinereous. Fabr.

Same country as the former.

CHIMARIS. Posterior thighs dentated; black spotted with white; anterior legs very long. Fabr.

Native of South America.

GUTTATUS. Thighs subdentated; black; thorax with two spots at the base; wing-cafes tuberculated and dotted with whitish. Oliv.

Native of Cayenne.

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FASCICULARIS. Thighs black; wing-cafes tufted with down; legs varied with cinereous. Oliv.

Native of Cayenne.

HYSTRIX. Thighs black; wing-cafes with crenated striæ, and two white dots.

MARMORATUS. Brown spotted with white. Oliv.

Native of Cayenne.

SCABER. Thorax carinated; wing-cafes grooved, the elevated ridges armed with tuberculated spines. Fabr.

Inhabits Cayenne.

CYLINDRIOSTRIS. Thorax scabrous; wing-cafes bituberculated behind. Oliv.

This is a large species found in New Holland. Banksian cabinet.

STIGMA. Wing-cafes with a large ferruginous spot. Linn.

Inhabits India.

HEBES. Thorax scabrous; wing-cafes sulcated, tuberculate; mouth bearded. Oliv.

Native of Bengal.

ANNULATUS. Thighs dentated, pale; thorax and wing-cafes streaked with black. *Curculio annulatus*, Linn.

Native of India.

CALIGINOSUS. Wing-cafes striated with approximate dots. Fabr.

Inhabits England. The thorax is rounded and carinated; thighs acutely dentated.

DUBIUS. Thighs dentated and black; thorax smooth; wing-cafes striated scabrous. Fabr.

Native place unknown.

ROREUS. Sprinkled with fulvous; anterior legs elongated. Fabr. *Curculio adspersus*, Mant.

Native of Cayenne.

BRUNNEUS. Brown; snout fuscous; wing-cafes testaceous, striated with dots. Oliv.

Banksian cabinet. Inhabits the Cape of Good Hope.

ABIETIS. Black; wing-cafes marked with linear interrupted white lines. Linn.

Found on the pine trees in Europe; rare in Britain.

DENTIPES. Thorax white; wing-cafes black with white lines; shanks dentated. Oliv.

Native of Senegal.

MULTIGUTTATUS. Black; thorax and wing-cafes dotted with white. Oliv.

PUPILLATOR. Thighs dentated tuberculate, and fuscous; wing-cafes with a large grey marginal spot, dotted with black. Oliv.

Native of Cayenne.

RETICULATUS. Oblong, pitchy; wing-cafes reticulatèd, oblique bands pale; anterior shanks spinous. Fabr.

Found at Tranquebar by Dr. Koerig.

LAPATHI. Thighs bidentated, white and black varied; thorax and wing-cafes mucated. Linn.

Inhabits the willow in Europe.

IRRORATUS. Thighs dentated white; above fuscous spotted with white; thighs annulated with white. Fabr.

Native of Cayenne.

TRICINCTUS. Deep black; side of the thorax, with three bands on the wing-cafes white; anterior legs elongated. Fabr.

Inhabits Guadaloupe island.

STATUA. Deep black; wing-cafes sulcated, with a common white spot; posterior thighs elongated. Fabr.

Native place unknown.

6-GUTTATUS. Black wing-cafes with three white dots. Fabr.

An American species in the collection of Dr. Hunter.

CURCULIO.

- LURIDUS.** Thighs dentated ovate, dull black; wing-cafes striated with dots. Oliv.
Native of New Holland.
- STOLIDUS.** Thighs fuscous; posterior sinaks incurvated and toothed. Fabr.
Bankian cabinet. Native of the Cape of Good Hope.
- FRIGIDUS.** Fuscous, wing-cafes striated, slightly tuberculated, and varied with ferruginous. Fabr. *Curculio chinensis*. Oliv.
Native of China and Amhoyna.
- GIBBUS.** Black; wing-cafes with excavated dots, and an abbreviated whitish streak. Oliv.
Inhabits the island of Bourbon.
- OCELLATUS.** Dull, and cinereous; wing-cafes marked with an ocellar black spot. Oliv.
Native of Cayenne.
- MEDITABUNDUS.** Thighs dentated; wing-cafes striated, and acuminate behind. Oliv.
Native of New Holland. Bankian cabinet.
- STUPIDUS.** Thighs black; sides of the thorax rounded; wing-cafes subspinous. Oliv.
Inhabits New Holland.
- MANGIFERÆ.** Dull; thorax scabrous, with a dorsal white line; wing-cafes reticulated. Oliv.
Lives, according to Dr. Koenig, in the nut of the mangifera.
- STULTUS.** Greyish; wing-cafes with a common lunated cinereous spot; snout deep black. Fabr.
Native of Coromandel. Vahl.
- ARANEUS.** Obscure varied with cinereous; thorax rounded at the sides. Fabr.
Native of South America.
- STRIX.** Black; thorax lineated with ferruginous; wing-cafes striated with ferruginous dots. Oliv.
Inhabits Cayenne. The head is ferruginous; wing-cafes short; thighs acutely dentated.
- SQUALIDUS.** Villous-grey, with testaceous snout. Oliv.
Native of Surinam. Bankian Cabinet.
- GERMANUS.** Black; thorax with two testaceous dots. Paykull.
Found in Germany, but not commonly.
- SCROPHULARIÆ.** Thorax whitish; wing-cafes with two black dots connected with white. Paykull, &c.
Native of Europe.
- VERBASCI.** Black; sides of the thorax yellowish; wing-cafes dotted with black and white in alternate striæ. Fabr.
Inhabits near Kiel.
- BLATTARIÆ.** Whitish; wing-cafes varied with black; dorsal spot at the base and tip black. Fabr.
Native of Italy.
- SOLANI.** Dull; wing-cafes with raised lines, black, dotted with cinereous. Fabr.
Inhabits Saxony. The head is black; legs greyish.
- GRAVIS.** Black; wing-cafes varied with ferruginous; thighs grooved. Oliv.
Native of the Cape of Good Hope.
- 5-PUNCTATUS.** Wing-cafes at the suture, and two dots white. Linn.
Found on plants in Europe.
- GUTTULA.** Thorax tuberculated and black; wing-cafes striated, with a white dot behind. Fabr.
Found in Saxony.
- ABBREVIATULUS.** Fuscous, sprinkled with greyish dots; wing-cafes abbreviated. Fabr.
Same country as the preceding.
- ECHII.** Black; thorax and wing-cafes lineated with white. *Curculio geographicus*, Oliv.
Found in Germany.
- DIDYMUS.** Above fuscous; wing-cafes striated, with a transverse white spot at the sides. Paykull.
Inhabits Germany, on the nettle.
- LAMII.** Black; thorax tuberculated; wing-cafes varied with cinereous; snout arched and black. Fabr.
Native of Germany.
- BRASSICÆ.** Villous-grey; snout arcuated and deep black. Fabr.
A small European species. The thorax is smooth, dusky, and greyish; legs blackish.
- BORRAGINIS.** Villous-grey; feet rufous. Oliv.
Inhabits France.
- HÆMORRHOIDALIS.** Thorax fuscous; sides greyish; wing-cafes at the suture and tip ferruginous. Fabr.
Native of New Holland, in the Bankian Cabinet.
- TRIMACULATUS.** Wing-cafes black, with three cinereous spots; the posterior forming a common lunule. Paykull.
Found in Alface by professor Hermann.
- LITURA.** Varied white and black; snout deep black. Paykull.
Lives on the thistle. A native of Europe.
- VILLOSUS.** Villous-grey; scutel, and oblique posterior band on the wing-cafes white. Herbst.
Native of Germany.
- RAPHANI.** Blackish; thorax tuberculated; snout bent and deep black. Fabr.
- VARIANS.** Black; wing-cafes rufous; margin black. Paykull. *Curculio beccabungæ*.
Found on the pine in Sweden.
- TROGLODYTES.** Fuscous; thorax with a dorsal cinereous line; wing-cafes and legs testaceous. Paykull.
Inhabits Europe near Kiel.
- CARBONARIUS.** Oblong, deep black; antennæ club-villous; wing-cafes marked with crenated striæ. Fabr.
Native of Europe.
- ATERRIMUS.** Black; tip of the thorax bidentated; wing-cafes glossy. Fabr.
- CERASI.** Deep black; thorax bidentated at the tip; wing-cafes oblong. Linn.
Native of Europe.
- VIOLACEUS.** Black; wing-cafes striated and violaceous. Linn.
Inhabits the north of Europe, on the pine.
- PROBOSCIDEUS.** Griseous; snout twice as long as the body. Fabr.
Native of North America.
- NUCUM.** Body greyish, and length of the snout. Fabr.
Inhabits Europe, and feeds on the nut.
- GULOSUS.** Dusky-brown; legs testaceous. Fabr.
Found near Paris.
- PARASITA.** Ferruginous sprinkled with cinereous; thighs with a black spot. Fabr.
Native of Cayenne.
- ESURIENS.** Griseous; scutel, dorsal line on the thorax, and common spot on the wing-cafes behind whitish. Fabr.
Inhabits France.
- NASUTUS.** Brown; wing-cafes striated, cinereous, with the tips brown. Oliv.
Described from a specimen in the British Museum. Its native place unknown.
- HAUSTELLATUS.** Chestnut; wing-cafes striated; snout four times the length of the body. Oliv.
Native

CURCULIO.

- Native of the Cape of Good Hope.
VARIUS. Grey and black varied; snout and legs rufous. Fabr.
 Inhabits Cayenne.
CERASORUM. Fuscous, scutel and wing-cafes with obsolete cinereous bands. Paykull.
 An European species.
AMOENUS. Deep black; two dots on the thorax and five on the wing-cafes snowy. Oliv.
 Native of New Holland.
METALLINUS. Brassy-black; thorax dotted; wing-cafes striated with dots. Fabr.
 Inhabits South American islands.
BICORNIS. Griseous; head bidentated. Fabr.
 Native of New Zealand.
TENUIROSTRIS. Black, with numerous white waves; antennæ rufous.
 Native of Europe. The club of the antennæ is grey, as is also the scutel.
DRUPARUM. Wing-cafes testaceous, obsoletely fasciated. Linn.
 Native of Europe.
FRAXINI. Ferruginous-brown; head and back black. Paykull.
 Found on the ash in Sweden.
MELANOCEPHALUS. Brown; head fuscous; snout deep black. Fabr.
 Native of Saxony.
DEPRESSUS. Thorax depressed; sides obtusely angulated. Linn.
 Inhabits South America.
POMORUM. Body grey clouded. Linn.
 Found on the flowers of fruit-trees.
VORAX. Grey and fuscous spotted; snout bent and deep black. Fabr.
 An Italian species.
TORTRIX. Body testaceous; breast fuscous. Linn. *Curculio ferrugineus*, Geoffr.
 Native of Europe.
TREMULÆ. Blackish; wing-cafes striated, and sprinkled with grey. Paykull.
 Found on the poplar in Sweden.
ÆSTUANS. Fuscous, lineated with cinereous; legs pale. Fabr.
 Native of South America.
TENIATUS. Thorax black; anterior and posterior margin rufous; wing-cafes pale, spotted with black. Paykull.
 Native of Europe. Snout black; mouth sanguineous.
ELONGATUS. Thorax elongated; anterior shanks bidentated. Fabr.
 Native of Jamaica.
- Section *** *Snout long; posterior Thighs formed for leaping.*
- ALNI.** Wing-cafes testaceous, with two dusky spots. Paykull.
 Inhabits England and other parts of Europe.
PILOSUS. Black, varied with cinereous. Fabr.
 Native of England, in the Banksian Cabinet.
HORTORUM. Deep black; band and half band, with the legs, testaceous. Fabr. *Curculio mutillatus*, Laichart.
 Native of Germany.
SALICETTI. Deep black; shanks testaceous. Fabr.
 Found on the willow in Sweden.
SALICIS. Wing-cafes deep black, with two white bands. Linn.
 A native of Europe; found on the willow.
- VIMINALIS.** Body testaceous. Paykull. *Curculio quercus*, Linn. *Curculio ulmi*, Degeer. *Curculio rufus*, Geoffr.
 Inhabits same country as the former.
ILICIS. Blackish; wing-cafes striated, varied with cinereous; future at the base white. *Curculio roboris*, Bonfd. Curcul.
 Feeds on the oak.
FRAGARIÆ. Fuscous; antennæ and feet testaceous. Fabr.
 Native of Germany.
POPULI. Deep black; scutel white; antennæ and legs testaceous. Fabr.
 Found on the poplar.
- **** *Short snouted; Thighs unarmed.*
- ARGYREUS.** Body silvery-green, spotted with gold. Linn.
 Native of India.
SPLENDIDUS. Wing-cafes striated, and spotted with gold; base gibbous, tip pointed. Fabr.
 Native of Brasil. Size of the diamond beetle, and far less common.
SUMPTUOSUS. Wing-cafes greenish, with raised black dots; base gibbous. Oliv.
 Found in Cayenne.
IMPERIALIS. Deep black, with alternate longitudinal black raised lines, and streaks of green-golden spots; tip of the wing-cafes pointed. Fabr.
 This is the resplendently coloured insect, known by the name of the diamond beetle. The species inhabits South America, chiefly Brasil.
CHRYSIS. Whitish; wing-cafes pointed; two bands and two dots of gold. Fabr.
 Described by Olivier, from a specimen in the collection of the late French king.
REGALIS. Body silky green, with broad golden bands. Linn. Donov. Inf. India.
 An extremely rich and elegant species. This beetle is so very scarce in India, that the wing-cafes, or sometimes the whole insect, is mounted like a gem on rings, and worn by the great as an ornament on the finger. *Vide* Donovan's Insects of India.
MARGINATUS. Fuscous; wing-cafes at the future, and the margin of the abdomen golden. Fabr.
 Native of Cayenne. Dr. Hunter.
19-PUNCTATUS. Whitish-hoary; thorax with four black spots; wing-cafes with nineteen. Oliv.
 Same country as the last.
16-PUNCTATUS. Blueish; four spots on the thorax, and twelve on the wing-cafes black. Oliv.
 A Brasilian species. The head is sulcated.
DECORUS. Above fuscous; thorax and wing-cafes marked with two green-gold stripes. Fabr.
 Native of Brasil.
NITIDULUS. Covered with green scales; wing-cafes dotted. Fabr.
 A Cayenne species.
CANDIDUS. Wing-cafes spinous and white; with a lateral fuscous spot. Fabr.
 Native of Cayenne.
NIVEUS. Snowy; thorax and back of the snout fuscous; wing-cafes spinous and pointed. Fabr.
 Native of Cayenne.
LACTEUS. White, with a golden gloss; wing-cafes sulcated and pointed. Fabr.
 Native of Jamaica.

CURCULIO.

- PULVERULENTUS.** Cinereous; head flat and grooved. Fabr.
Inhabits Tranquebar.
- SMARAGDULUS.** Greenish; wing-cafes dotted, with a strong erect spine before, and another behind. Fabr.
Native of Cayenne.
- OCTOTUBERCULATUS.** Varied fuscous and cinereous, dotted, and gibbous behind; tubercles eight. Fabr.
Native of Cayenne.
- MODESTUS.** Cinereous; thorax and wing-cafes spotted with brown. Fabr.
Inhabits New Zealand. Banksian Cabinet.
- FLAVESCENS.** Dull; thorax and wing-cafes acumined, the sides yellow. Fabr.
Native of South America.
- LATERALIS.** Covered with green scales; sides of the thorax and wing-cafes yellow. Fabr.
Native of India.
- VERIDIS.** Green; sides of the thorax and wing-cafes yellow. Linn.
Found on the plumb in Europe.
- AURIFER.** Body ferruginous, spotted with gold. Oliv.
Native of South American islands.
- SPLENDIDULUS.** Shining-green; wing-cafes in the disk cinereous, banded with black. Fabr.
A Siberian species.
- MORBILLOSUS.** Thorax and wing-cafes fuscous and grey varied, with numerous elevated dots of deep black. Fabr.
Inhabits France and Barbary.
- NEBULOSUS.** Hoary; wing-cafes banded obliquely with black. Linn.
Native of Europe.
- MARMORATUS.** Black, and rough with white lines; wing-cafes white, sprinkled with black squarish spots. Fabr.
Inhabits Germany.
- SULCIROSTRIS.** Oblong, cinereous, and somewhat clouded; snout trifurcated. Linn.
Found on plants in Europe.
- PORCULUS.** Blackish, varied with cinereous; head retuse, and with the snout carinated. Linn.
Native of Hungary.
- PERLATUS.** Black; abdomen white, with raised glabrous black dots; snout grooved. Fabr.
Native of China.
- GLAUCUS.** Snout carinated; thorax unequal and dull; wing-cafes glaucous; an elevated dot behind. Fabr.
- DISPAR.** Oblong, fuscous, with villous grey spots. Fabr.
Native of the East Indies.
- VETULA.** Griseous; wing-cafes rugged, black, with cinereous spots; snout deep black. Fabr.
Inhabits Tranquebar.
- CRENULATUS.** Cinereous, with three crenulated waved lines on the wing-cafes. Oliv.
Native of New Holland.
- INCANUS.** Oblong, and fuscous; thorax flat on the back. Linn.
Found on plants in Europe.
- COSTATUS.** Cinereous; thorax black, with four cinereous lines. Fabr.
Native of the south of France.
- LONGIMANUS.** Fuscous, margin of the thorax, and two dots ferruginous; anterior legs long. Oliv.
Native of Brasil.
- SPINIFEX.** Cinereous sprinkled with brown; thorax acutely spined. Fabr.
- MICANS.** Brown-golden, legs ferruginous. Fabr. *Curculio pyri*, Paykull.
Found in gardens in Denmark.
- MURINUS.** Fuscous, with the thorax trilineated; wing-cafes with alternate pale and dusky lines, and dotted with black. Fabr.
Native of Europe.
- POLYGONI.** Thorax lineated; wing-cafes cinereous, marked with three fuscous lines, and dotted with black. *Curculio polygoni*, Linn., &c.
Inhabits Europe. The snout is grey, with a longitudinal white line.
- 3-GUTTATUS.** Blackish; wing-cafes grey, with two white dots; the posterior one large and common. Fabr.
Native of Britain.
- ARUNDINIS.** Yellowish; two dorsal fuscous lines on the thorax. Paykull. *Curculio luteus*, Knoch.
An European species.
- GRESSORIUS.** Griseous; head and thorax black, with a white dorsal line. Fabr.
Native of Italy.
- GRAMINEUS.** Black; wing-cafes striated; antennæ and legs ferruginous. Fabr.
Found on graminiferous plants in Germany.
- CORYLI.** Cinereous and fuscous varied; wing-cafes at the future half way down black. Fabr.
Inhabits England.
- LINEATUS.** Fuscous, with three paler streaks on the thorax. Linn.
Found on plants in Europe.
- FUNDASCENS.** Cinereous; back fuscous. Fabr.
Native of Italy.
- FULVIPES.** Downy greyish; legs testaceous. Paykull.
Inhabits Saxony. Hybner.
- RUFICOLLIS.** Testaceous; head and wing-cafes striated, cinereous brown. Fabr.
- FULVICORNIS.** Brown; wing-cafes with undulated bands of cinereous. Fabr. *Curculio ruficornis*, Paykull.
Found on trees in Europe.
- HIRSUTULUS.** Cinereous, and hispid; wing-cafes striated; antennæ and legs yellowish. Fabr. *Curculio echinatus*, Bonf.
- SCABRIUSCULUS.** Cinereous; head and thorax canalliculated; wing-cafes hispid. Linn. Bonf.
Found in sandy places in Europe.
- LIMBATUS.** Deep black; marginal stripe down the wing-cafes, and the scutel golden. Fabr. *Curculio lateralis*, Paykull.
Inhabits Europe.
- PARVULUS.** Green; antennæ and shanks testaceous. Fabr.
Native of Italy.
- VRIDICOLLIS.** Thorax green and scaly; wing-cafes striated and black. Fabr.
Inhabits Germany, on the oak.
- STRIATUS.** Fuscous; wing-cafes striated, cinereous, with black dots. Fabr.
Native of Barbary.
- LACERTA.** Griseous; wing-cafes striated; antennæ black at the tip. Fabr.
An East Indian species, in the Banksian Cabinet.
- RUFICORNIS.** Deep black, with rufous antennæ; thorax on each side bituberculated. Linn.
Found

CURCULIO.

Found on plants in Europe. The wing-cafes are striated.

CANALICULATUS. Cylindrical, deep black, with the legs rufous; thorax canaliculated. Fabr.

A small species, and inhabits American islands.

CLOROPUS. Cylindrical, black; wing-cafes striated; antennæ and legs rufous. Linn. *Curculio piniperda*, Herbit.

Native of Europe; found on the oak.

TRISTIS. Black; wing-cafes grooved, cinereous. Fabr.

Native of Sweden and England.

RAUCUS. Black; wing-cafes striated, fuscous, with cinereous spots. Paykull.

Inhabits Saxony.

ADSPERSUS. Deep black; wing-cafes behind spotted with white. Oliv.

Described from a New Holland species in the Banksian Cabinet.

PUNCTATUS. Fuscous; wing-cafes with elevated silky dots. Paykull.

Native of Sweden.

MAXILLOSUS. Ovate, black; jaws exerted and bent. Fabr.

Native of Hungary. Hybner.

ROTUNDATUS. Black; wing-cafes with dotted striæ; antennæ and shanks rufous. Fabr.

Native of Germany.

VARIOLOSUS. Black; thorax carinated, and variolous; wing-cafes striated. Fabr.

Found in Saxony.

SUCCINCTUS. Deep black; margin of the wing-cafes, and two small lines white. Fabr.

Native of the Cape of Good Hope.

CAMELEON. Brassly; future of the wing-cafes, and abbreviated stripe green-gold. Oliv.

Inhabits Jamaica.

VITTATUS. Deep black; wing-cafes marked with abbreviated white and red lines. Linn.

An elegant species, found in Jamaica.

SPENGLERI. Wing-cafes yellow, with very glabrous abbreviated lines of black. Linn.

Native of American islands.

BIVITTATUS. Wing-cafes with striæ of dots, and a marginal and an interrupted dorsal band of yellow. Fabr.

Inhabits the island of St. Thomas.

LIVIDUS. Griseous; thorax and wing-cafes cinereous and black spotted. Oliv. *Curculio hisfrionicus*, Sparmann.

An insect of large size, found in South America.

FESTIVUS. Wing-cafes yellowish, with abbreviated black streaks, and a marginal one sanguineous. Fabr.

Native of South America.

IMPRESSUS. Black; thorax and wing-cafes with impressed dots of white. Fabr.

Inhabits Jamaica.

RIVULOSUS. Black; thorax spotted with rufous; wing-cafes with three impressed cinereous lines. Fabr.

Native of the East Indies.

VERRUCOSUS. Brassly-black, with raised dots; wing-cafes warted behind. Fabr.

Native of the Cape of Good Hope.

CAPENSIS. Black; thorax with elevated dots; wing-cafes with crested striæ. Linn.

Inhabits same country as the former; the snout is sulcated.

6-VITTATUS. Black; thorax rough and lineated with white; the wing-cafes pointed. Oliv.

Native place unknown.

INÆQUALIS. Thorax unequal, prominent in front; wing-cafes grooved, and fulcated behind; snout tri-fulcated. Fabr.

An African species, in the Banksian cabinet.

ACUMINATUS. Cylindrical, fuscous; wing-cafes pointed at the tip. Fabr.

Native of New Zealand.

EMERITUS. Black; thorax and wing-cafes spinous; front excavated. Linn.

Native of India.

CULTRATUS. Cinereous; thorax with two compressed tubercles; wing-cafes tuberculated, the posterior part cinereous. Fabr.

Inhabits New Holland.

TRIBULUS. Cinereous; thorax scabrous, the anterior part impressed; wing-cafes spinous. Fabr.

Inhabits same country as the last.

4-DENS. Cinereous; thorax scabrous; wing-cafes spinous; four posterior spines longest. Fabr.

Native of New Holland.

CLAVUS. Whitish; thorax canaliculated; wing-cafes spinous; three small red lines at the base. Oliv.

Inhabits New Holland.

RUBIFER. Cinereous; thorax scabrous; wing-cafes with sanguineous spines. Fabr.

Native of the Cape.

GLOBIFER. Thorax scabrous; wing-cafes spinous, acumined behind. Fabr.

Inhabits the Cape of Good Hope. The snout is smooth and thick at the tip; legs black.

PILLULARIUS. Thorax armed each side with a nodulous spine; wing-cafes with tuberculated striæ; tip acumined.

Native of the Cape of Good Hope.

GLANDIFER. Dull; thorax scabrous; wing-cafes with three elevated spinous lines. Fabr.

Inhabits the Cape of Good Hope.

Section ***** *Snout short; Thighs dentated.*

SPECTABILIS. Body black, varied with green spots. Oliv. *Donov. Inf. New Holland.*

This is the elegant insect known by the name of the diamond beetle of New Holland, to which part of the world this species is peculiar.

PINGUIS. Anterior thighs toothed; gibbous, and blackish; throat with yellowish lines; wing-cafes with two yellowish streaks, and a small line at the tip. Fabr.

Native of Cayenne.

TRIBENS. Cinereous; wing-cafes emarginate at the tip, with three teeth. Fabr.

Native of New Zealand, in the Banksian cabinet.

FUSCO-MACULATUS. Black; thorax and wing-cafes smooth, and spotted with brown. Fabr.

Found in the north of Germany.

ZEBRA. Black; wing-cafes variegated with white. Fabr.

Native of Saxony.

LIGUSTICI. Body dusky; thorax rough and cinereous. Oliv.

Found on the *ligusticum levisticum*.

NUBILUS. Gray; wing-cafes with numerous darker, and nearly square spots. Fabr.

Inhabits Hamburg. The antennæ are black, with the club pointed.

CURCULIO.

CALCARATUS. Black; antennæ and legs rufous. Fabr. Native of Austria.

GEMMATUS. Black; wing-cafes with green dots. Oliv.

Inhabits Europe.

PICIPES. Grey; wing-cafes clouded, striated with subocellate dots. Fabr.

BISULCATUS. Black; thorax and wing-cafes rough; snout with two grooves. Fabr.

Native of Italy. The snout marked with impressed grooves; thorax subcinereous at the sides.

PYRI. Bronzed, changeable to yellow, red, brown, or green; legs rufous. Linn. Donovan. Brit. Inf.

Not uncommon. Inhabits Britain, and most other parts of Europe.

DENTIFER. Cinereous; snout grooved before; posterior thighs tridentated. Fabr.

Native of the East Indies.

CURVICORNIS. Grey, with the sides white; middle pair of thighs bidentated. Fabr.

Inhabits same country as the former.

ARGENTATUS. Covered with fine green bronzed scales; antennæ and legs brown. Linn.

Very abundant in May and June on the birch and alder, in Britain. Donovan. Brit. Inf.

ALBO-LINEATUS. Cinereous; thorax and wing-cafes with white lines; snout black beneath. Fabr.

Native of Saxony.

ATELLAHOIDES. Snout and wing-cafes with a single tubercle. Fabr.

Inhabits Brasil.

ÆRUGINOSUS. Green; thighs ferruginous; antennæ long. Bonfd.

Native of Sweden.

ANTHRACINUS. Black; wing-cafes with striate dots; thighs single toothed. Fabr.

Found by Scopoli in Carniola.

LUGUBRIS. Brown; wing-cafes rough, substriated, rather downy and connected. Fabr.

Native of Italy.

CÆLESTRINUS. Blue; antennæ and legs sanguineous. Scopoli.

Native of Germany.

ROESELII. Thorax dull green, with a longitudinal white line; wing-cafes fulvous, brown with raised lines. Fabr.

Inhabits same country as the preceding.

ARGENTEUS. Silvery green; antennæ and shanks rufous; thighs brown and clavated. Fabr.

Native of Europe.

HÆMORRHODUS. Brown; antennæ, legs, and tip of the abdomen rufous; wing-cafes greenish brown.

Native of Europe.

Section **** Lip bifid; Jaws bifid and short; snout short. *Anthribus*, Fabricius.

ALBINUS. Black front, and tail white. Degeer.

Inhabits Europe; rarely found in Britain. Donovan. Brit. Inf.

LATIROSTRIS. Snout very broad and flat; tip of the wing-cafes white, with two black dots. Fabr.

Native of Saxony; scarce in England. Donovan. Brit. Inf.

ALBIROSTRIS. Snout very broad, flat, and white; wing-cafes black, white at the tip, with a palmated black spot. Herbit.

Inhabits Saxony.

MACROCEROS. Grey; wing-cafes cinereous behind. Fabr.

Native of New Holland.

SCABROSUS. Black; wing-cafes with raised striæ, rufous with scattered black dots. Fabr.

Native of Europe.

UNDATUS. Black; wing-cafes brown, with white wavy streaks. Fabr.

A species of middle size, found on flowers in Africa.

VARIUS. Wing-cafes striated with alternate white and black dots. Paykull.

SEPICOLA. Varied with cinereous and brown, and raised hairy dots. Fabr.

Inhabits Germany, and is found in hedges.

Section ***** Lip rounded, horny; Feelers very short.—*Brachycerus*, Fabricius.

APTERUS. Thorax spinous, with an impressed cross; wing-cafes dotted with ferruginous. Fabr.

Inhabits India.

OCELLATUS. Thorax spinous, excavated before; wing-cafes cinereous, with black subocellate dots. Fabr.

Native of Madagascar.

SCALARIS. Thorax spinous, unequal; body black; wing-cafes with rufous denticulated striæ. Fabr.

Inhabits the Cape of Good Hope.

OBESUS. Thorax spinous and unequal; body black; wing-cafes red, with clouded black dots. Fabr.

Inhabits the Cape of Good Hope.

GLOBOSUS. Thorax spinous, and marked with five grooves; wing-cafes smooth.

Native of India.

ROSTRATUS. Brown; head and thorax cylindrical and narrow; wing-cafes spinous behind. Fabr.

Inhabits the warmer parts of Africa.

INEQUALIS. Thorax rough; wing-cafes with raised crimped lines; head bidentated. Fabr.

This is of a large size, and inhabits the Cape of Good Hope.

CRISPATUS. Black; thorax spinous and grooved; wing-cafes cinereous, the outer angle crimped and toothed. Fabr.

A native of Barbary. The head is black; thorax punctured.

CORNUTUS. Cinereous; thorax and wing-cafes subspinous; spines of the wing-cafes with fasciculate hairs. Olivier.

Native of India.

ALGIRUS. Cinereous; thorax spinous, grooved; wing-cafes with two raised spinous lines, and between these two raised dots. Fabr.

Native of Africa.

RETUSUS. Grey-brown; wing-cafes retuse, and toothed behind. Oliv.

Inhabits the Cape of Good Hope.

SPECTRUM. Brown; thorax and wing-cafes globular. Oliv.

Inhabits same country as the last.

MURICATUS. Thorax spinous, grooved, black, opaque; wing-cafes with three raised crenated lines. Oliv.

Native of Hungary.

UVA. Thorax spinous, and unequal; wing-cafes with numerous raised obtuse tubercles. Oliv.

This is of the middle size, and inhabits the Cape of Good Hope.

CURCUM, in *Ancient Geography*, a town placed by Ptolemy in the interior of Libornia.

CURCUM, in the *Materia Medica of the Arabians*, the name of the largest celandine; the roots of which, when dried, were used by the dyers of those times as a yellow colour, and by the physicians as deobstruents.

CURCUMA, in *Botany*, (from the Arabic name curcum, or hercum.) Roscoe. Linn. Transf. 8. 354. tab. 20. fig. 12.

Ess. Ch. Anther double, two-spurred. Filament petal-shaped, three-lobed; middle lobe bearing the anther.

Cafs and order, *monandria, monogynia*. Nat. Ord. *Scitamineæ*, Linn. Rosc. *Cannæ*, Juss.

Obs. As Mr. Roscoe, in his reformed arrangement of the plants belonging to this natural order, has stated that the calyx, corolla, and nectary differ greatly in the different species of the same genus, we have not attempted a detailed natural character of curcuma. He observes that this genus is not less distinguished from amomum and zingiber by its general habit and inflorescence, than by the parts of its fructification. In all the species the leaves are radical; but amomum and zingiber are both caulescent. Curcuma has a simple scapus and the flowers are enveloped in large loose bractes, not in compact scales as in zingiber. From some circumstance not easy to be accounted for, Linnæus has characterized this genus as having four barren stamens, besides the fertile one, which no subsequent observer has been able to discover. Mr. Dryander supposes that the generic character of Linnæus was derived from his *C. rotunda*, now referred to *Kämpferia*.

Sp. 1. *C. Zedoaria*. Rosc. 1. (*Amomum zedoaria*; Mart. Willd. *A. latifolium*; Lam.) "Leaves egg-shaped, acuminate; bractes emarginate." See **AMOMUM Zedoaria**.
2. *C. montana*. Rosc. 2. Roxb. Pl. corom. 2. tab. 151. "Leaves egg-shaped, acuminate; bractes lanceolate, coloured at the tip." 3. *C. longa*. Turmeric. Rosc. 3. Linn. Sp. Pl. 2. Mart. 2. Willd. 2. Woodv. med. bot. tab. 132. Lam. 2. (*Amomum curcuma*; Jacq. Hort. Vind. 3. tab. 4. *Curcuma radice longa*; Herm. Ludg. tab. 209. *Curcuma*; Rumph. Amb. 5. 162. tab. 67. *Manjella-kna*; Rheed. Mal. 11. 21. tab. 11. *Cannacorus radice crocea*, five *curcuma officinarum*; Tournef. 367.) "Leaves ovate-lanceolate, bractes spatulate." Root perennial, creeping, fleshy, palmate with cylindrical branches, and jointed with parallel rooting circles; bark thin, pale; flesh saffron-coloured, with a bitterish taste, and a somewhat fragrant smell. Stem none. Leaves broad-lanceolate, large, quite entire, smooth, annual, pale-green, densely furrowed with oblique slender lines; petioles long, erect, dilated at the base, mutually supporting and clasping each other. Scape external, three inches long, slender, nearly erect, almost naked, approximating to the cluster of leaves. Spike thick, somewhat egg-shaped, three inches long; scales membranous, a little acute, whitish, half-spreading, united laterally below the middle. Flowers sessile, white, with a yellow nectary, one within each scale of the spike. Calyx. Perianth superior, bifid; segments oblong-egg shaped, erect, concealed by the scales of the spike. Corolla monopetalous, funnel-shaped; tube slender, equal to the perianth, dilated towards the top; border four-parted; segments nearly equal in length; two lateral ones obtuse, undulate-plaited; uppermost acute, incurved; lowest broader, bifid, with roundish segments. Nectary large, incurved, three-lobed and the middle lobe emarginate, adnate at the base to the exterior segment of the corolla. Stamen. Filament one, broad, flat, short, rounded at the top, standing on the uppermost segment of the corolla; anther not closely adhering to the filament (exortica), somewhat cubical, bifid, with an awl-shaped appendage standing out on each side.

Pistil. Germ roundish; style capillary, equal to the stamen, included in the groove of the anther; stigma concave. *Pericarp*. Capsule roundish, smooth and even, three-valved, three-celled. Seeds round, few. We have literally translated the above description from Loureiro, because it was taken from a recent plant which grew in its native soil, though it does not accord with Mr. Roscoe's ideas concerning the anther. Loureiro seems to have confined the term to the upper or middle lobe of what Mr. Roscoe calls the anther, and to have considered all the lower part, with its two lateral lobes, as one of the segments of the border of the corolla; but in this case he must, through an oversight, have committed an error in his description of the situation of the filament, and have written *lacinia summæ corollæ inflexens*, instead of *lacinia infimæ*, &c. We are rather confirmed in our conjecture by an attentive consideration of Koenig's description, as published by Retzius and translated by professor Martyn (for we have not the original at hand); and which Mr. Dryander assures us belongs to the present plant. See Linnæan Transactions, vol. ii. p. 212. It stands thus: Tube of the corolla erect, or a little bent in, round, smooth, stiffish, white, above the middle bell-shaped, somewhat compressed, keeled at the back; border double, each three-parted. Filament single, erect, lanceolate-ovate, between the two dorsal segments growing to the dorsal border, flatish, somewhat convex in front, marked with a line behind half the length of the approximating segments, stiffer than they, but of the same colour. A native of the East Indies, China, and Cochinchina, where also it is generally cultivated for the sake of its root, which is the turmeric of the shops. See **TURNERIC**. 4. *C. pallida*, Mart. 3. Loureiro Coch. 1. 9. (*Curcuma agreftis*; Rumph. Amb. 8. p. 164.) "Leaves lanceolate; bractes short; bulbs knotty." Roots perennial, horizontal, creeping, oblong, cylindrical, twisted, knotty, pale within and without, fleshy, with little smell and taste. Plant annual, three feet high, stemless, erect. Leaves lanceolate, large, with numerous oblique slender furrows; petioles dilated at the base, embracing the inner ones. Scape external, eight inches long, clothed with short bractes; spike oblong; scales ovate-lanceolate, lax, reflexed, reddish, one-flowered; corolla yellowish white, four-cleft; nectary three-lobed; stamen one. A native of China about Canton and Cochinchina. The pounded root is used externally in cases of contusion and local pains. Loureiro has given no description of the filament and anther: but its want of a stem and general habit seem to indicate that it really belongs to this genus as it is settled by Mr. Roscoe.

CURD, in *Rural Economy*, is the coagulum, or whitish solid substance produced from milk, from which cheese is formed. See **CHEESE** and **DAIRYING**.

CURD-Mill, is a kind of mill contrived for the purpose of reducing and breaking down the coagulum or curd, in making cheese. It consists of two cylinders or rollers of about six inches in diameter, and fifteen inches long; one being placed above the other in a thin deep chest, as in the common cyder mill of the more southern districts. The superior upper roller is studded with iron spikes an inch in length, and an inch and half asunder, while the lower one is closely beset with bevil-headed nails, rising with a sharp angle about a tenth of an inch out of the surface of the roller. The curd, after being partially broken over, is put into a hopper, the bottom of which is formed by the upper roller, which, by working against the side of the box, prepares the curd for the lower roller, which being finer, and working closer, reduces it to small particles or granules. The rollers are turned by a crank placed on one end of the

axle of the upper one; the opposite ends of them having each a wooden-toothed wheel, which wheels work in each other, by which means the lower one is turned with facility. This is a sort of machine which must be highly useful in large cheese dairies, where the breaking of the curd by the hand is a business of vast labour, and which requires much time. It is principally employed in the final breaking down of the curd, by which it is rendered more fine and equal than could be done by the hand.

CURDISTAN, or **KURDISTAN**, in *Geography*, a mountainous country of Asia, whence issue the different branches of the Tigris, which, surrounding the upper part of the great Zab, passes to the southward, as far as the frontiers of the Irak-Aojemi, or Persian Irak. Some geographers consider it as one of the divisions of the Turkish province of Diarbekir, anciently known by the name of Assyria. It lies on the east side of the Tigris, towards Persia, being bounded by that kingdom on the east, and by the Tigris on the west, by Irak on the south, and Turcomania on the north. Towards the south it is narrow, scarcely exceeding 90 miles in breadth; but northwards it stretches near 300 miles from east to west, that is, from the 41st to the 47th degree of east longitude; and from north to south it reaches from 35° 30' to 37° 20' N. latitude. The mountain of Costras separates it from Persia on the E., and the Tigris on the W., from Mesopotamia and Chaldæa. According to ancient accounts this country was rich and fertile; but it is now desolate and barren, abounding with deserts, except in those few parts which lie near towns, and which are somewhat better cultivated. It was in former ages the constant field of battle between the Parthians and Romans, and at a later period between the Turks and Persians, which served to depopulate it, and to render it waste and unproductive. Its chief towns and hamlets are Belis, the capital, Scheresal, Arbela, Harpel, Nineveh, Rehobo, Rhesen, Van, and Holwan. It is inhabited by the *Curds*, who are divided into tribes, which are dispersed over the Lower Asia, and have widely extended themselves, especially within the last hundred years. Volney suggests that *Gord* and *Curd* are the same, and that the habitations of the Curds are among the Gordæan mountains, or the *Gord-ouai*, where, according to the Chaldæan Berofus, and the Armenian Maribas, cited by Moses Chorenensis, Xisuthrus landed, after escaping from the deluge. They are supposed to be the same people who are mentioned by Xenophon under the denomination of *Curd-uchi*, and who opposed the retreat of the ten thousand. This historian observes, that though shut in on all sides of the Persian empire, they had constantly braved the power of the "Great King," and the arms of his "satraps." In their modern state they are little different from what they were formerly; for though they are apparently tributaries to the Porte, they pay little respect to the orders of the grand signior, or his pachas. According to the account given of them by Niebuhr, who travelled in these countries in 1767, they are subject, in their mountains, to a sort of feudal government, similar to that which is observed among the *Druzes*. Each village has its chief, and the whole nation is divided into different and independent factions. The disputes inseparable from this state of anarchy have detached from the nation a great number of tribes and families, which have adopted the wandering life of the Turkmans and Arabs. These Curds are dispersed in the Diarbekir, and over the plains of Arzroum, Erivan, Sivas, Aleppo, and Damascus; and all their tribes are estimated to exceed 140,000 souls, that is, 140,000 armed men. Like the Turkmans, these Curds are pastors and wanderers; they are often shifting their position in search of pasture for their numerous flocks and herds; and whilst the men roam in

quest of plunder, the women are occupied in making butter and cheese, and training up the children to the trade of the fathers. Their tents are large, and formed of a sort of coarse brown cloth, which serves as a covering to their houles, which are constructed for temporary use of cane hurdles, disposed in a square form, and having the floor matted, so as to answer the purposes both of bed and board. When they dislodge in order to migrate, they take their huts to pieces, and load their oxen and cows with them, and also with their children, and household utensils. The children are used to go almost naked in the coldest weather. The men are generally well mounted, and take great care of their horses, which are commonly very swift in their motion; the lance is their chief weapon. The women ride either on horses or on oxen. Both men and women are naturally stout and nimble, but not at all agreeable in their persons, having very small eyes, wide mouths, bad complexions, very black hair, and a very fierce and forbidding aspect. The Curds differ from the Turkmans in some particular customs. The latter give their daughters a marriage portion; the former receive a premium for them. The Turkmans pay no respect to nobility or antiquity of extraction; the Curds highly honour it. The Turkmans do not steal; the Curds are almost every where considered as plunderers; and they are therefore much dreaded in the neighbourhood of Aleppo and Antioch, where they occupy, under the name of "Bagdashlia," the mountains to the E. of Beilam, as far as near Kles. In this pachalic, and in that of Damascus, their number exceeds 20,000 tents and huts; for they have also fixed habitations. They are reputed Mahometans; but they never trouble themselves about religious rites or opinions. Several of them, distinguished by the name of *Yezdia*, worship "Shaitan" or Satan, according to the ancient system of the *good* and *evil* principles, which has more or less prevailed in the Diarbekir, and the frontiers of Persia. The language of the Curds is divided into three dialects. It has neither the aspirations nor the gutturals of the Arabic, and Mr. Volney says that it does not resemble the Persian; and, if this be the case, it must be an original language. Considering the antiquity of the people who speak it, and that they are related to the Medes, Assyrians, Persians, and even the Parthians; Volney conjectures, that a knowledge of this tongue might throw some light on the ancient history of these countries. See Volney's *Travels*, vol. i. sect. 2.

CURDLING, the coagulating or fixing of any fluid body; particularly milk, by means of rennet. See **CHEESE**.

Pausanias says, that Aristæus son of Apollo, and Cyrene daughter of the river Peneus, were the first who found the secret of curdling milk.

At Florence they curdle their milk for the making of cheese with artichoke flowers; in lieu of the rennet used for the same purpose among us.

The Bisaltæ, a people of Macedonia, Rochfort observes, live wholly upon curdled milk, *i. e.* on curds. He adds, that curds are the whole food of the people of Upper Auvergne in France, and wher they only drink.

Women newly delivered are subject to have their milk curdled, converted into little grumæ, in their breasts, which occasion violent pains, with a shivering in the back. It is owing to the want of being sucked; whence the method of remedying, and preventing it, is apparent.

CURE, in *Geography*, a small town of France, in the department of the Yonne, on the river Cure, which falls into the Yonne at Cravan.

CURE, in *Medicine*. See **PALLIATIVE cure**.

CURE of souls, a benefice, the incumbent whereof has the charge

charge and guidance of the souls of the people within a certain extent of ground, called a *parish*.

Such are a vicar, a rector, &c. in contradistinction to a prebend, a dean, a chanter, &c.

CURES, *fine*. See SINE.

CURE, in *Falconry*, the same with *Casting*; which see.

CUREL, in *Geography*, a town of France, in the department of the Upper Marne, one league N. of Joinville.

CUREMA, in *Ichthyology*, the name of a fish of the mullet kind, but of a remarkable size, growing to two feet long, and having a very large moveable upper lip; the under one being small, triangular in figure, and scarcely visible, being something shorter than the upper. Its eyes are large, and its fins of a fine silvery white; in all other respects it resembles the common mullet. See MULLUS.

CUREMONTE, in *Geography*, a town of France, in the department of the Correze, and district of Brives, $4\frac{1}{2}$ leagues S.E. of Brives.

CURENA, or CURNA, in *Ancient Geography*, a town of Asia, in Media.

CURENSE, or CORINSE LITTUS, a place on the coast of Spain, with a gulf over against the town of Gades, according to Pliny: supposed by Hardouin to lie between the Guadalquivir and the Guadalate.

CURES, or CURIS, a town of Italy, which was anciently the capital of the Sabines, who from hence assumed the name of "Quirites." After the treaty concluded between Romulus and Tatius, which produced a coalition of the two nations, the Sabines were called Romans, and the Romans Quirites, or Sabines. However, that name, as well as *Tribus Quirina*, was applied, with the greatest propriety, to that canton of the Sabines inhabiting Cures, and the district appertaining to it. The principal deity worshipped here seems to have been Juno Quiris, or Curis. She was represented with a spear or lance in her hand; from which circumstance she received the appellation of "Quiris or Curis," a word in the Sabine language equivalent to the Latin "hasta." Macrobius mentions a Sabine deity under the name of Janus Quirinus, supposed to be the "Pater Curis," held in high veneration among the Falisci.

Cures was situated in the territory now called Correze, or Cureze, upon a small river of the same name, which falls into the Tiber above La Farfa. In the days of Strabo it was a poor mean village, and was afterwards so totally destroyed, that its situation cannot now be ascertained. Cluverius, however, believed, that the ruins of it were to be seen in his time, about a mile from the town of Salici. If this be admitted, it stood near the banks of the river Heinella, the *P'Alia* of the moderns. Holstenius thought that Cluverius was mistaken in fixing upon a place now called "Il Vescovio" as the site of the ancient Cures. The abbé Chauppy, availing himself of some circumstances, which we need not recite, discovered on the Salar way, where the church of St. Anthime stood in the midst of a wood, very considerable ruins of Cures. These ruins were found in the territory of Fare, at a place called "Arcei," on the left bank of the river Correze.

CURETES, in *Antiquity*, a sort of priests, or people of the isle of Crete; called also *corybantes*.

The name Curetes, according to Strabo, was given them because of their cutting off the hair before, to prevent the enemy's taking hold thereof: the word being Greek, *κρυπτες*, of *κρυπ*, *tonsure*, from *κρυω*, *to*nd. Others derive it from *κρηστροφια*, the *feeding* or *educating* of a child; because they are said to have educated Jupiter.

The Curetes are said to have been originally of Mount

Ida, in Phrygia; for which reason they were also called *Idæi Daçtyli*. Ovid says, they had their origin from a huge shower of rain: Lucian and Diodorus Siculus represent them as very expert in casting of darts; though other authors give them no weapons but bucklers and pikes: but all agree in furnishing them with tabors and castanets; and relate, that they used to dance much to the noise and clashing thereof.

These Curetes are said to have inhabited the mountains, under the shade of thick trees, caves, and other places, which naturally afforded shelter and covering, as the art of building houses was not then practised. They were very ingenious, and invented a variety of things that proved highly useful to mankind; they first taught how to manage flocks, to gather honey, to tame horses, to hunt, and to cast darts. They formed men into societies and communities, and shewed them, by their example, the happiness of a peaceable and orderly life. They are likewise said to have invented swords and helmets, and to have introduced the custom of dancing in armour. By the noise they made in these dances, they prevented Saturn from hearing the cries of Jupiter when he was an infant, and, by that expedient, saved him from being destroyed by his father. The Curetes described by Diodorus Siculus (lib. v.) were, according to Herodotus, (lib. v. c. 58.), and Strabo, (lib. x. p. 464.); originally Phœnicians, who accompanied Cadmus out of Phœnicia; some of them settling in Phrygia, where they were called "Corybantes;" some in Crete, where they were known by the name of "Idæi Daçtyli"; and some in Rhodes, where they bore the name of "Telchines." Accordingly, Vossius (*De Idololat.*) distinguishes three kinds of Curetes; those of Ætolia, who inhabited Pleuron, those of Phrygia, and those of Crete, who were originally derived from the Phrygians.

The first, he says, took their name from *κρυπ*, *tonsure*; because, from the time of a combat wherein the enemy seized their long hair, they always kept it cut; but they are said to have suffered the hinder part to grow, that they might be caught by it if they offered to run away: those of Phrygia and Crete, he supposes, were so called from *κρηστρος*, *young man*; because they were young; or because they nursed Jupiter when he was young.

Clemens Alexandrinus (*Stromat. lib. i.*) calls the Idæi Daçtyli barbarians, that is, strangers; and says that they were the first who brought letters into Greece, Phrygia, and Crete; adding, that by their assistance Minos built a fleet, and gained the sovereignty of the sea. According to the authors now cited, the Curetes and Idæi Daçtyli were the same people, and did not settle in Crete till the time of Minos. Bochart (*Canaan, lib. i. c. 15.*) traces them to Palestine, alleging the similarity of their name to that of the Crethins or Cerethites, a Philistine tribe. See CRETE.

Some authors, however, give a different account of the Curetes: according to Pezron, and others, the Curetes were, in the times of Saturn, &c. and in the countries of Crete and Phrygia, and among the Titanic Celtes, what the druids and bards were afterwards among the Gauls, &c. *i. e.* they were priests who had the care of what related to religion, and the worship of the gods.

Hence, as in those days, it was supposed there was no communication with the gods but by divinations, auguries, and the operations of magic; the Curetes passed for magicians and enchanters: to these they added the study of the stars, of nature, and poetry; and so were philosophers, astronomers, &c.

Such were the Curetes, and after them the druids; with

this difference, that the Curetes, in the time of the Titans, went to the wars; for which reason they were armed, and were wonderfully dextrous in dancing cap-à-pie, shaking their bucklers and javelins: from which action, Pezron conjectures, they took their name Curetes; *curo*, in the Celtic, being the same with *κέρω* in the Greek; *q. d. I strike, or beat*.

It is uncertain, however, whether they went to the wars, and encouraged the combatants with their noise and dances, or were exempt from that duty as the druids were; but they must have been different from the bards, who, though of the same order, were, nevertheless, obliged to excite and encourage the people to war with their poetic compositions and musical performances.

According to Kircher, the Curetes were what the *spirits* are among the Cabbalists, the *powers* in Dionysius, the *demons* among the Platonists, and the *genii* among the Egyptians.

CURFEU, *q. d. couvre-feu*, a signal of retreat, given in cities taken in war, &c. to advertise the inhabitants to go to bed, and not to stir out any more.

The *curfew-bell*, wherewith the signal was anciently given, was sometimes hung up as a punishment of sedition. Pasquier says, it was called *carfou*, and *garefou*; as being intended to advertise the people to secure themselves from the robbers and debauchees of the night.

The most ancient curfew was that established in England by William the Conqueror; who appointed, under severe penalties, that, at the ringing of a bell at eight o'clock in the evening, every one should put out their lights, cover, or rake up their fires, and go to bed. Whence, to this day, where a bell is accustomed to be rung about bed-time, it is called *curfew-bell*. It was abolished by Henry I.

In reference to this subject, we may observe, that William of Malmesbury says, in his account of Henry I., "that he restored, in his court, the use of lamps in the night, which had been intermitted in the time of his brother." This is the single passage in any historian before Polydore Vergil, which seems to allude to the curfew, supposed by that author (lib. ix.) to have been introduced by an ordinance of William I., and mentioned by some later writers, as a mark of the slavery, in which he held the conquered English. It is plain, however, from these words, says lord Lyttelton, (Hist. Henry II. vol. i. p. 473.) that William of Malmesbury thought it was introduced by William Rufus, and extended to the whole court, that is, to the Norman nobles, as well as to the English, and, consequently, was no proof of the servitude of the latter. M. Voltaire says (Univ. Hist. t. i. p. 240.) "that the law, far from being tyrannical, was only an ancient *police*, established in almost all the towns of the North, and which had been long preserved in the convents." He adds this reason for it, "that the houses were all built of wood, and the fear of fire was one of the most important objects of general *police*." From the expression of William of Malmesbury, above cited, one should think that, in England, it had only been practised in the king's court, or was taken off *only there* by Henry I. And the foregoing words, *effeminatos curia propellens*, which introduce the whole sentence, and have a connection with it, appear to imply, that some unnatural crimes had been committed in the court, under the cover of the darkness; on which account the use of lamps was *there* restored by that prince. Upon the whole, as Polydore Vergil is too modern a writer to be of any authority, and all the ancient historians are silent about it, lord Lyttelton thinks there is reason to doubt, whether the law, or regulation he mentions,

was made by William I., or was ever so general as he represents it. The curfew-bell may have been only rung in the convents, and probably took its name from an old practice there, of putting out their fire and candles at 8 o'clock every night. In the "Leges Burgorum" of David I., king of Scotland, mention is made of it as marking the time when the watch should go out. As, therefore, the practice of it existed in Scotland, no less than in England, and as it was also a law of police, which William had previously established in Normandy, it could be no badge of a *conquest*, nor any evidence of a nation being enslaved.

CURFEU, Fr. An alarm bell. Formerly in strong, enclosed and fortified places, and particularly in frontier towns, it was customary to have a high tower or steeple, from which they could discover the movements of the enemy. He who observed, or kept a look-out, rung the large bell in it as soon as he discovered or saw from it any thing extraordinary. If he saw infantry coming towards the place he hoisted colours on the side by which it was approaching; but a standard, if he perceived cavalry; and both, if he observed infantry and cavalry. The moment he perceived fire in any place he also rung it. It was by the *beffroi*, or the large bell in the said tower or steeple, that they rung the curfew, when an officer went immediately to see the gates shut. In the morning the same bell was rung for the opening of them. After the founding or ringing of the curfew, the inhabitants were not permitted to leave or go out of their houses.

CURGIA, in *Ancient Geography*, a town of Spain, in Bætica. Ptol.

CURGIE, in *Geography*, a village of Scotland, with a small harbour, on the coast of the county of Wigton, in Luce bay; 3 miles N. from the Mull of Galloway.

CURGOS, or KURGOS, a large island of Egypt, situated on the Nile, several miles long, full of villages, trees, and corn, opposite to which is the mountain Gibbainy, a scene of ruins consisting of broken pedestals, plainly designed, says Bruce, for the statues of the dog, and some pieces of obelisk, with hieroglyphics, almost totally obliterated: this is conjectured by the same traveller to be the ancient city of Meroë, whose latitude should be 16° 26', and in this island, as he conceives, was the observatory of that famous cradle of astronomy. Curgos, he says, should, probably, be Purgos, the Ethiopians not being able to pronounce P, and not having such a letter in their alphabet; and Purgos was the tower or observatory of that city. Travels, vol. iv. 539.

CURIA, in our *Ancient Customs*, was sometimes used for the persons, as feudatory and other customary tenants, who did their suit and service at the court of the lord. And it was usual for the kings of England to summon the bishops, peers, and great men of the kingdom, to some particular place, at the chief festivals in the year; and this assembly is called, by our historians, *curia*; because they were consulted about the weighty affairs of the nation: whence it was sometimes also called *solemnis curia*, *generalis curia*, *Augustalis curia*, and *curia publica*, &c.

CURIA, in *Ancient Geography*, Coire, a considerable town of Rhætia.

CURIA, FRANCESCO, in *Biography*, a Neapolitan painter, was born about the year 1538, and studied under Lionardo da Pistoja. The churches of Naples possess many of his works, which, although they somewhat partake of the mannered style introduced by Vafari and the Zuccheri, are much esteemed for the spirit with which they are composed, the beauty of character in the heads, and truth of colouring.

His

His altar-piece of the circumcision in the church of the Pieta, was, by the common consent of Spagnoletto, L. Giordano, and Solimene, ranked amongst the finest productions of the pencil which Naples could boast. He died about the year 1610. Dominici.

CURIA, among the Romans, denoted a portion, or division of a tribe.

In the time of Romulus, a tribe being the third part of the 3000 foot of which his columns consisted, comprehended ten curiæ, besides 300 horsemen, each curia being 100; so that this legislator made the first division of his people into thirty curiæ or wards. These curiæ were again subdivided into 10 decuriæ.

Over the curiæ were appointed officers, called *curiones*, and over the decuriæ, others called *decuriones*: each curia and decuria having its peculiar commander. Romulus afterwards divided his small territory, which was not above five or six miles in extent, into three unequal parts; one of which was appropriated to the expences of religious worship, another reserved for the king's revenue and the exigencies of the state, and the third, which was the most considerable, divided into 30 portions, corresponding to the 30 curiæ. In the forming of a senate, consisting of 100 persons, each tribe named three senators, and each of the curiæ the like number, amounting in all to 99, and Romulus named the 100th, who was the head or prince of the senate, and the chief governor of the city, when the king was in the field. (See SENATE.) Romulus also ordered the curiæ to choose for him a guard of 300 young men, ten out of each curia, who were called *celeræ*, which see. In regulating the concerns of religion, he ordained, that each curia should have its own temple, and its peculiar gods and priests. He who presided over each curia was called CURIO, and he who presided over them all CURIO MAXIMUS.

Afterwards, *curia*, or *domus curialis*, became used for the place where each curia held its assemblies for performing divine service.

Hence, also, curia passed to the senate-house; and it is from hence the moderns come to use the word *curia*, court, for a place of justice, and for the judges, &c. there assembled. See COURT.

Varro derives the word from *cura*, *care*, *q. d.* an assembly of people charged with the care of public affairs: others deduce it from the Greeks; maintaining, that at Athens they called *κῦρια* the place where the magistrate held his assizes, and the people used to assemble: *κῦρια*, again, may come from *κῦρος*, *authority*, *power*; because it was here the laws were made.

CURIA *Curfus Aquæ*, in *Law*, a court held by the lord of the manor of Gravesend, for the better management of barges and boats using the passage on the river Thames from thence to London, and plying at Gravesend bridge, &c. mentioned in stat. 2 Geo. II. c. 26.

CURIA *Domini*, the lord's-house, hall, or court, where all the tenants attend at the time of keeping courts.

CURIA *militum*, a court so called; anciently held at Carisbrook castle, in the isle of Wight.

Et idem dominus Willielmus de insula facere debet scētam ad curiam domini castri de Carisbroc, de tribus septimanis in tres septimanas, in curia quæ vocatur curia militum.

CURIA *Penticiarum*, a court held by the sheriff of Chester, in a place there called the "Pentice," or "Pentice;" probably deriving its denomination from its being originally kept under a pent-house, or open shed, covered with boards. Blount.

CURIA, *Rectus in.* See RECTUS.

CURIA *Maria*, in *Geography*, an island in the Arabian Sea, near the SE. coast of Arabia; 40 miles long, and 16 broad. N. lat. 17° 20'. E. long. 55° 14'.

CURIA *Auxilium*, in *Law*. See AUXILIUM.

CURIACO, in *Geography*, a bay in Terra Firma, S. America, on the N. Sea.

CURIALITAS *Angliæ*. See CURTESY of England.

CURIAM, *Accedas ad*, in *Law*. See ACCEDAS.

CURIANUM, in *Ancient Geography*, a promontory of Gallia Aquitania, according to Ptolemy; supposed by M. D'Anville to be Cape Fernet, between the Adour and the Garonne.

CURIAS, *Cape Cavati*, or *Delle Gatti*, a promontory of the isle of Cyprus, at the extremity of the most advanced peninsula to the south of the island.—Also a town situated on the above-mentioned promontory.

CURIATA, *Comitia*. See COMITIA *curiata*.

CURIATII, in *Roman History*, three brothers, selected by the Alban general as champions for a contest with three other brothers, named Horatii, chosen by Tullus Hostilius, king of Rome, in order to decide the difference subsisting between Alba and Rome. A. U. C. 87. B. C. 667. On an interview between the two commanders of the hostile armies, the Alban general, declining to terminate the dispute by a single combat with Tullus Hostilius, according to the proposal of the latter, suggested that three champions should be chosen out of each camp for determining the quarrel. As soon as the agreement was known in the two armies, it excited a strong emulation among the young warriors for the honour of being chosen to this important combat. During the intermediate suspense, Fuffetius cast his eyes upon three Albans, of the circumstances of whose birth, Dionysius Halicarnassensis (lib. iii.) has given the following account: Sequinius, an illustrious citizen of Alba, had two daughters; one married to Curiatius, a citizen of Alba, and the other to Horatius, a citizen of Rome. These two sisters were brought to bed on the same day, each of three male children, who were at this interesting period in the flower of their age, and remarkable for their strength and dexterity. The Alban general having fixed on the three Curiatii, the king of Rome having his attention directed to the three Horatii, proposed the matter to them, who consulted their father on the occasion. The father, dreading the event, and apprized of the betrothment of one of his daughters to one of the Curiatii, hesitated for some time in complying with the wishes of his sons; but the love of his country ultimately prevailing over every other consideration, he left his sons to their own choice. When he was informed that in imitation of the Curiatii, they preferred a glorious death, or an important victory, to an inglorious life, he lifted up his eyes to heaven, and, embracing his children, exclaimed, "I am a happy father!" and then commanded them to announce to the king his consent.

The combat of the Horatii and the Curiatii being proclaimed in both camps, Tullus led the former, and Fuffetius the latter, whilst the people srewed the way, as they passed, with flowers, and put garlands on their heads; for they were considered as victims, who had voluntarily devoted themselves for their country. A plain lying between the two camps was chosen for the place of combat; and the two kings advanced with their champions and *feciales* to the middle, where, before the combat began, they concluded a treaty which served as a pattern for most of the treaties that were ever after made by the Romans. When this solemnity was finished, the champions advanced with a slow pace towards each other; and before they com-

menced the hostile attack, they embraced each other with all the expression of the most tender and sincere friendship. The spectators shed tears at the sight, and muttered complaints against the kings for causing such affectionate relations to shed the blood of one another. The tenderness of the young heroes, however, did not abate their courage; each of them resumed his arms, and selected his adversary. The combat then began with great impetuosity; the noise of their arms was heard at a great distance; and the air resounded with a confused mixture of shouts and acclamations from both camps, as either of the combatants appeared to have the advantage. The victory was long held in suspense, by the skill and valour of the combatants. At length the eldest of the Horatii received a mortal wound, and fell. At this fight the Albans triumphed, and the Romans were thrown into great consternation, which was soon followed with despair when they saw the second Horatius, pierced through by another of the Curiatii, expire on the body of his brother. However, the three Alban brothers were wounded, and the surviving Horatius appeared unhurt and vigorous. Thinking he was an unequal match for the three brothers together, he had recourse to a stratagem, and retreated as if he fled: Upon this the Curiatii pursued him at different distances as their respective strength allowed; Horatius, perceiving the success of his stratagem, and that they were separated from each other, hastily returned, and slew them all singly, before one could advance to the assistance of the other; and, elated with his victory, seized the spoils of the vanquished:—the Roman camp in the mean while resounding with joyful acclamations in honour of their hero. Thus Rome gained the superiority over Alba, its mother-city; which Fuffetius acknowledged on the field of battle, saluting Tullus as his sovereign, and asking him what were his commands. Tullus replied; “I command you to keep the Alban youth in readiness to march at my orders, in case I make war with the Veientes.”

As Horatius was returning to the city, he was met by his sister, who, perceiving him loaded with the spoils of the three brothers, among which was a military robe which she had wrought with her own hands for the Curiatius to whom she had been betrothed, could not forbear tearing her hair, beating her breast, and reviling her brother with the most reproachful and provoking words, for imbruing his hands in the blood of his relations. Horatius, flushed with his late victory, and enraged at his sister's unseasonable grief, killed her upon the spot, and then proceeded to the house of his father; who not only approved the action, but would not allow his daughter to be buried in the sepulchre of the Horatian family. However, upon the return of Tullus to Rome, Horatius was brought by some illustrious citizens before the tribunal, to take his trial. Thinking it dangerous to relax the rigour of the laws in favour of conquerors, they insisted on his being tried, and condemned, if found guilty. Tullus, anxious to manifest his regard for the laws, and at the same time solicitous for saving young Horatius, and also foreseeing that he would be censured by some for condemning, and by others for acquitting the criminal, dextrously changed the affair into a state crime, the cognizance of which did not belong to him, but to two commissioners, or duumviri, whom the king was to name. The crime was notorious, nor was it disowned by the prisoner; the duumviri, therefore, without delay, pronounced sentence against him, in these words: “We judge you to be guilty of treason; go, dictator, and tie his hands.” As soon as judgment was given, Horatius, by the king's advice, appealed to an assembly of the people, who revoked the sentence of the

duumviri, rather through admiration of his courage, says Livy, than for the justice of his cause. However, that the crime might not escape wholly unpunished, Horatius was condemned to pass under the yoke, an ignominy with which it was usual to treat prisoners of war, who had surrendered their arms. The king also appointed expiations to pacify the anger of the gods, provoked by this violation of the laws. Besides, the pontifices erected two altars, one to Juno, and the other to Janus, which were still remaining in the time of Augustus, together with the yoke, known by the name of “*Sorum tigillum*,” under which they made the criminal pass. Liv. lib. i. cap. 25, 26. Dionys. Hal. lib. iii.

CURICACA, in *Ornithology*, the name of a Brazilian bird, the wood-pelican of Catesby, and wood ibis of Pennant. See *TANTALUS loculator*.

CURICTA, in *Ancient Geography*, an island of the Adriatic Sea, on the coast of Illyria, according to Pliny and Ptolemy; called by Strabo *Cyralica*; the present isle of Vegia.

CURICUM, a town of the fore-mentioned island, now called *Vegia*.

CURICUM, a town of Asia, in Isauria.

CURIGLIANO, in *Geography*, a river of Naples, which runs into the gulf of Tarento; 5 miles N.E. of Corigliano.

CURIMATA, in *Ichthyology*, a name by which some authors have called the lavaretus, a small fish, of a sort of middle nature, between truttaceous and the herring kind, and caught in the American and German lakes.

CURING, is used for preserving fish, flesh, and other animal substances, by means of certain additions of things, to prevent putrefaction. One great method of doing this, is by smoking the bodies; that is, the making them to imbibe a great quantity of vegetable fumes: for this is usually done where wood is burnt. The reason of this sort of preservation is easily seen by the curious enquirer, since wherever wood, or any vegetable of the acid tribe is burnt, the acid particles go off with the smoke, and in this form penetrate into, and lodge themselves in animal substances exposed thereto; by which means this smoke acts upon them in the same manner that the fumes of spirit of nitre would do: and whether it be not a nitrous acid that tinges hams, herrings, &c. to a redness in the drying, is a subject worthy of enquiry. Shaw's Lectures, p. 152.

CURINI, in *Botany*, or Curiginil. Lam. Enc. Rheed. Mal. 7. 47. tab. 45. Baccifera indica; Rai. Hist. iii. 357. A plant little known, which has somewhat of the habit of a menispermum, and seems to have some affinity to cissus. Stems cylindrical, farmentous, somewhat woody, leafy. Leaves opposite, petioled, oval-acute, entire, soft, smooth, whitish-green above, deeper green underneath, with somewhat projecting nerves. Flowers small, yellowish-white, axillary, forming branched corymbs shorter than the leaves; petals five, green without, white and woolly within, a little hooked at the tip; stamens five, small; germ superior, roundish. Fruit. Drupe oval-oblong, bright green, with whitish and rather bitter flesh; nut hard, whitish; kernel white, slightly bitter, and astringent. A native of the East Indies.

CURIO, CAIUS SCRIBONIUS, in *Biography*, a Roman orator, distinguished for the part which he took in the civil war between Pompey and Cæsar. He was at first a partizan of Pompey, and selected to oppose the ambitious designs of Cæsar: but being of licentious manners, and overwhelmed with debts, he could not withstand the temptation of a high bribe

bribe offered him, and became the opponent of him in whose cause he had joined. In battle, with the troops of Pompey, he fought with vigour and success, but being afterwards led into an ambuscade, his troops were cut to pieces, and he himself fell either by his own hand, or in the general slaughter. This happened B. C. 48. By the poet Lucian, Curio is spoken of in extravagant terms of applause, but, by the historian Velleius Paterculus, he is described as "a man of noble birth, an accomplished speaker, bold, lavish alike of his own fortune and person, and of those of others, most ingeniously profligate and mischievously eloquent, one whose lust for money and for pleasure, no wealth, no enjoyments could satiate." By Plutarch, Curio is represented as the friend and associate of Cato in his early years. Plutarch. Univers. History.

CURIO, COELIUS SECUNDUS, was born at Chericco, in Piedmont, in the year 1503. He was educated at Turin, and made great proficiency in polite literature. He had not attained his 20th year, when he became attached to the doctrines of Zuinglius and Luther, and his zeal in their defence caused him to be thrown in prison, where he was confined for several months. Persecution did not in the least abate his ardour; his disposition being frank and engaging, he was dismissed the place of confinement, with recommendations that might have promoted his worldly interests; but having access to the relics of the monastery in the abbey of St. Benigno, he conceived and executed the plan of carrying away the holy shrine, and leaving in its place what to him was more holy and estimable, the Bible, inscribed with these words, "Hæc est arca fœderis, ex qua vera sciscitari oracula liceat, et in qua veræ sunt sanctorum reliquiæ." The day, however, was approaching, when the fraud would be discovered, and when, he was aware, the fury of the populace would not permit him to escape with his life, if he were even suspected of it; he, therefore, thought it prudent to retire, and we find him afterwards at Milan, and other cities of Italy. At the former place he resided many years, employed in the arduous and honourable task of education: but what raised his reputation the highest, were the courage and humanity which he displayed during a dreadful plague which ravaged that city. Neither dread of danger, nor the disgusting nature of the duties prevented him from visiting the sick, and supplying the various wants of the poor and the dying. In 1530, he married, and afterwards met with very unhandsome treatment from his own relations. At Turin he was, after the lapse of many years, arrested, on account of the shrine, and imprisoned. It was supposed that the most rigorous punishment would befall him, but he contrived to escape, went first to Milan, and afterwards to Pavia, where he gave lectures on the belles lettres: but his enemies were ever on the alert, and the inquisitors had orders to seize him; his scholars, however, and the people, in general, entertained for him so high a respect, that they formed for his defence a sort of body-guard; and thus he lived three years, when the pope himself interfered, and he was obliged to seek a retreat in Venice, and from thence he went to Lucca, where he not only met with a favourable and kind reception, but was appointed professor. Scarcely had he been at Lucca a single year, when orders were sent to the senate to arrest him; from them he received intimation of the design, and he determined to quit Italy for ever. He went to Lausanne, and was chosen principal of the college: his wife and children he had left at Lucca, till he knew whither he might conduct them in safety. When he thought himself secure, he went to Pisa, in order to bring his family to his

new residence; here, while he was at dinner in a public inn, he was arrested; the officer, out of respect probably, came alone into the room, to make known his business: Curio, advancing with his knife in his hand, so alarmed him, that he fainted, and the professor, who ever possessed great presence of mind, walked down stairs, through the attendants, who were not acquainted with his person, and escaped. He got to Lausanne in safety, and had the satisfaction of taking with him his wife and family, whom he met with on his road. He resided at Lausanne four years, and in 1547 he removed to Basil, where he held the office of professor of eloquence and the belles-lettres with the highest reputation for more than twenty years. He died, Nov. 24, 1569, in the 67th year of his age. He was author of many works written and published in the Latin, Italian, and French languages. On theological subjects, the most important were "Christiænæ religionis institutio, et de liberis educandis:" and "De amplitudine Regni Dei;" in the latter he endeavoured to prove that the number of the elect was greater than that of the reprobated: for this, one might suppose, harmless doctrine, he was denounced; and submitted to write an apology, which was published in the 12th volume of the *Amœnitates Literariæ*. Franc. 1730. Gen. Biog.

CURIO, the chief and priest of a curia.

Romulus, upon dividing the people into *curiæ*, gave each division a chief, who was to be priest of that *curia*, under the titles of *curio*, and *flamen curialis*.

His business was to provide and officiate at the sacrifices of the curia; which were called *curionia*; the curia furnishing him with a sum of money on that consideration: which pension or appointment was called *curionium*.

Each division had the election of its curio; but all these particular curiones were under the direction of a superior, or general, called *curio maximus*; who was the head of the body, and elected by all the curiones, assembled in the *comitia curialis*.

All these institutions were introduced by Romulus, and confirmed by Numa, as Halicarnassens informs us. Godwin will have two curiones in each *curia*.

CURIOSOLITES, in *Ancient Geography*, an ancient people of Gaul, in Armorica, so called by Cæsar, and placed by M. D'Anville N.W. of the Redones.

CURIOSI *Naturæ*, *Academy of the*. See ACADEMY.

CURIOSUS, an officer of the Roman empire, during the middle age, appointed to take care that no frauds and irregularities were committed; particularly no abuses in what related to the posts, the roads, &c. and to give intelligence to the court of what passed in the provinces. This made the curicfi people of importance; and put them in a condition of doing more harm than they prevented: on which account, Honorius cashiered them, at least in some parts of the empire, anno 415.

The curiosi came pretty near to what we call controllers: they had their name from *cura*, *care*; "quod curis agendis & evectionibus cursus publici inspiciendis operam darent."

CURIRI, in *Ornithology*, a variety of the *Todus paradisiæus*; which see.

CURISCHE-HAF, in Latin *Lacus* or *Sinus Curonicus*, in *Geography*, a lake, bay, or inland sheet of water formed at the estuary of the river Memel, in Prussia, joining the sea near Memel, and separated from the Baltic by a narrow ridge of land. It is 60 English miles in length, and about 30 in its greatest breadth, and derives its name from its situation in the ancient duchy of Curland or Courland. The coasts

crafts are inhabited by fishermen, who still go by the name of Cures, or Curen.

The Curische-Haf is full of dangerous sand-banks, and exposed to frequent and violent storms.

CURISCHE-NEHRUNG, that tongue or narrow ridge of land which separates the Curische-Haf from the Baltic Sea.

CURIUM, in *Ancient Geography*, a town and also a mountain of Greece in *Ætolia*.—Also, a town which, according to Strabo, was near the promontory of Curias, in the isle of Cyprus, lying to the N.E.; but, according to Ptolemy, it was separated from the promontory by the river Lycus. Curium was also the name of one of the small kingdoms into which the isle of Cyprus was divided. Strabo mentions an altar of Apollo, situated in this canton, so that any one who approached it risked being precipitated into the sea. The town is now called Piscopia; and the promontory Cape Cavati. See CURIAS.

CURIUS, DENTATUS MANLIUS, in *Biography*, an ancient Roman, who raised himself from almost the lowest rank, to the highest and most important offices in the state. He attained the rank of consul, B. C. 299, and shortly put an end to the long war that had been carried on between his countrymen and the Sannites: his courage and prudence fitted him for the difficult times in which he flourished. In some instances, the enemies of his country who were unable to conquer, or to cope with him, attempted, what has often proved a safer and a shorter enterprise, namely, to bribe him. The persons once employed to assail his virtue, found him cooking his humble meal with his own hands: he heard their offer, and manfully replied, “the man that could dine as he did had no occasion for gold:—that he accounted it more honourable to command the possessors of wealth, than to be rich himself; and that they might assure their countrymen, they would find it as difficult to corrupt as to conquer him.” Inflexible as the integrity of this patriot was, still he had his enemies: jealous of his superior talents, and envious of his well-earned fame, they accused him of converting, to his own purposes, part of the spoil taken from the enemy. He was examined on the subject, and confessed the fact—he had retained for his own use, a wooden oil-vessel for the purpose of making libations to the gods. On many occasions after this, he conferred on his country the most signal benefits; and on the defeat of Pyrrhus he had a magnificent triumph, exhibiting not only a vast quantity of rich spoils, but several captured elephants, animals that had never before been seen in Rome. The senate, on this occasion, offered him fifty acres of land, which the virtuous and self-denying consul refused, saying, that seven acres, the common share of every citizen, was enough for any man to live on. Of the latter days of this citizen we have no account: it is, however, recorded, to his honour, that he expended a large part of what he gained from the enemy in bringing the water of the river Anio to Rome. Plutarch. *Univerl. Hist.*

CURL, in *Agriculture*, is a vegetable disease which frequently attacks potatoe crops, producing a sort of crimped-up or curled appearance in the leaves. It is an affection which has been ascribed to various causes, by writers on vegetation; but the real nature of which does not seem to be well understood. Some situations are more exposed to the attacks of it than others; and in some it is said not to occur at all. This is the case, according to Mr. Headrick, in the little island of Arran in Scotland. It is likewise found by experience to be more common in such lands as have been long in the state of tillage, than in those which

have been newly broken up, or brought into the state of cultivation; and in grounds of the fenny and mossy kinds less frequently than in those of the more dry descriptions.

It has been stated in an interesting paper, inserted in the second volume of “Communications to the Board of Agriculture,” as having generally been supposed to be a specific disease, produced solely by contagion, not being conceived capable of arising without it; and that this contagion of necessity produces the disease in all crops with which it is permitted to come in contact. But this opinion is suggested, as appearing not to be well founded; as the disease does not necessarily propagate itself, which is sufficiently evident, it is imagined, both from observation and the result of experiment: for it is often found in fields of this sort of crops, that the most healthy plants are surrounded with those which are in the curled state; and that they not only continue in a state of health and vigour, while the crops remain on the land, but may even be afterwards mixed with them for a considerable length of time, without suffering any contamination. It is likewise ascertained, that healthy potatoes are afforded not only from such as have been thus mixed with those which were curled, but that it has been shewn by experiment, that they may be obtained from curled potatoes themselves, as will be seen below. It is also well known to farmers, that the curl often occurs where not any thing of contagion was communicated, nothing being more common than abundance of curled plants from roots selected with the greatest circumspection; from lands as well as districts, in which the disease has never been perceived. A farmer, whose potatoes had for two or three years been greatly injured by this disease, conceiving that it happened from infected seed, procured a large supply for himself, as well as some of his friends, from a district on the Tweed, where the disease at that time had never been seen: but it so happened, that, while some of the crops from these potatoes were entirely free from the curl, others, and particularly those planted by the farmer himself, were more injured by it than they had ever been before; which should not have been the case, if the common opinion were well founded, that the disease arises from an affection in the original set or root. Other causes must of course be sought for; and it is suggested, that those who take notice will find that whatever renders a crop poor and weakly is the most apt to produce the disease, and that it proceeds in a great measure, if not entirely, from this cause: and it is added, that the weakly state which affords it may be caused by a variety of circumstances, among which the following are the most frequent.

“I. In this district, the most frequent cause of it, perhaps, is the planting potatoes on ground altogether unfit for them. Potatoes require a light pervious or open mould, their germs not being of a nature that can penetrate a stiff soil. This, for a great length of time after potatoes first appeared in this country, met with such marked attention, that they were never planted but in the lightest spots upon the farm, and with such care that the plough was never employed for them: they were planted entirely with the spade, by which the soil was completely broken; hence they had vigorous plants, and rarely any appearance of curl. But on farmers wishing to extend the culture of potatoes, and being thereby induced to plant them on every variety of soil, as they now frequently do, the crops became weak, and the curl frequent. In the culture of every other crop, farmers take care to appropriate particular soils to each; for they know that they commonly fail, if this necessary piece of attention be overlooked. Those who have light sand only do

CURL.

not sow beans; while, on stiff clay soils, the culture of turnips is never attempted. In like manner, potatoes require a peculiarity of soil; and in so far as this is deviated from, the crop is commonly weak, and liable to curl. In a field of several acres, which every fourth year was planted with potatoes, about half an acre, or thereabouts," the writer says, "was stiff clay, while the rest was a free dark coloured loam, rather tending to sand than clay. On all this part of the field the crop was uniformly strong, and free of curl; while on the half acre of clay, although manured with the same quantity of dung, planted with the same seed, and in every circumstance managed in the same manner, the plants were all weak, and a great proportion of the whole curled.

"II. But imperfect culture is perhaps the most frequent cause of curl. This will be found to hold with such uniformity, that a crop of potatoes is commonly strong, abundant, and free of curl, in proportion to the previous culture given to the soil, and care taken to keep it clean after they are planted. This indeed is so remarkably the case, that, excepting in very kindly soils, the additional produce from trenching and planting with the spade is commonly more than sufficient to repay all the difference of expence between this mode of culture and that of planting with the plough. On a large scale, indeed, the spade cannot be employed, and plentiful crops are no doubt often obtained with the plough; but many are not sufficiently aware of the full necessity of ploughing and cleaning their grounds well before the crop is planted: for if the mould is not previously well broken, it cannot be done afterwards, so that the plants are weak from their first appearance, and a great proportion of the whole curled. The effect of complete previous tillage, in the culture of potatoes, is indeed so remarkable, that there is reason to believe, that the amount of our potatoe crop, in a great proportion of cases, would be more than double of what it commonly is, if the ground on which they are planted was previously put in better order. Of this many proofs might be given, but the writer only mentions two. A farmer, who every year planted several acres of potatoes with the plough, allowed his servants to plant nearly two acres for their own use; but these last, being commonly on spots of difficult access, could not easily be managed with the plough, and, being always in bad order, they were planted with the spade, in the form of what is usually termed lazy beds. The effect of this uniformity was, that although the crops, even of those planted with the plough, were always good, being sometimes at the rate of three hundred Winchester bushels on the Scotch acre, and weighing from eight to ten tons; the others, in different instances, weighed more than the double of this, and for the most part were entirely free of curl. And the writer soon after getting possession of a farm, being late in overtaking his potatoe crop, a considerable part of a field, which happened to be both full of root weeds and not sufficiently broken, was in that situation planted by his servants, before he knew of it; but half an acre, or thereabouts, being still worse than the rest, it was kept either with a view to give it a complete fallow, or to sow it with tares. The season, however, being dry, which favoured the cleaning of ground, this piece was three times ploughed, well harrowed after each ploughing, and the root weeds gathered and carried off. Being now in fine order, it received the same quantity of dung which was given to the rest; it was planted with potatoes taken from the same quantity, and in every other circumstance managed in the same manner: but the event was widely different. Although a week later in planting,

the crop was sooner above the surface; the plants were stronger from their first appearance, and scarcely a curled stem to be met with: while in every row of the others the curl was frequent. The ground was kept clean with less than a fourth part of the expence and trouble, the produce was more than double, the ensuing crop of wheat was considerably better on this piece, and the ground continued in every respect in better condition till the third crop, when more pains were taken with the rest of the field.

"III. The writer has reason from experiment to think, that small roots, or too small a portion of strong roots, being given to each set, has an influence in producing a weak crop, and curled plants. It is perhaps equally necessary, in the culture of potatoes, as in that of wheat, or any other crop, to make a choice of healthy full-grown seed; but this is not always done. Small potatoes are often indeed purposely kept for planting, instead of those that are full grown, and therefore more capable," the writer supposes, "of producing a vigorous progeny. In like manner, there is cause to suspect," he says, "that our frequent attempts of late years to discover new varieties of potatoes, by raising them from seed instead of the root, have had some influence in rendering the curl more frequent; plants raised from the seed being commonly, for the first two or three years, very weak and feeble. Sixty-four sets were planted: sixteen of which were full-grown potatoes; sixteen from small roots, in which no curl appeared when in the field; sixteen from roots raised from the feeds two years before; and sixteen from roots of plants strongly curled. They were all planted in the same manner, in a light soil, and in furrows parallel to each other, with a moderate quantity of dung to each, and covered to the depth of three inches. Of those taken from large potatoes, none were curled, and the plants were all strong and healthy. Some good plants appeared in each of the other rows, but nearly a half of the whole was curled. The proportion of curled plants was greatest in those lately raised from the seed; in the other two rows, they were nearly the same. The row planted with curled potatoes had seven curled plants, and the other only six; but in this last row, the other three were so weak from the first, that, although not obviously curled, they soon began to shrivel, and, in the course of two or three weeks, disappeared entirely.

"IV. It has," the writer says, "been mentioned by a noted planter of potatoes, that sets taken from roots that have sprouted early, and from which the germs have been rubbed, as is commonly done, with a view to the preservation of the sets, never fail to produce curl. The plants which succeed to the second production of germs are always very weak, and with such certainty produce curl, that he is induced to consider this as the only cause of it; but this attentive observer will find, that whatever tends to render a crop, or even particular plants in the crop, weak and delicate, will in like manner seldom fail to produce curl.

"V. Too much as well as too little dung appears," the writer says, "to have influence in producing curl: the first may probably act by corrupting the germ of the young plant; the latter, by not being sufficient to produce vigorous plants. This effect, resulting from an unequal application of dung, may perhaps be considered as the most frequent cause of that partial appearance of the curl, that we often meet with in fields managed all apparently in the same manner: for dung is often spread in such a careless slovenly manner, that, while some of the plants have none, others have it in too great a proportion, being sometimes covered with it to the depth of several inches.

“ VI. Too deep as well as too shallow planting,” he thinks, “ are both apt to produce the curl ; but the first of these errors is perhaps the most frequent. The sets should never be placed deeper at first than three inches, however useful it may afterwards prove to lay the earth up to the stems ; but instead of this, by the usual method of planting in drills, or ribs, as they are termed, and throwing two deep furrows over the plants, they are frequently covered to the depth of nine or ten inches : by which, from a total exclusion of air, and perhaps from other causes, the crop is always late in piercing the surface, and many of the plants are weak and curled. These ridges are indeed commonly harrowed down at last, but often not till it is too late. And where the plants are placed too near the surface, if the ground itself is dry, they rise in weak feeble stems ; and many are curled from want of moisture alone. With a view to ascertain the best depth for sets of potatoes, twelve were planted at eighteen inches deep, the same number at the depth of sixteen inches, fourteen, twelve, ten, eight, seven, six, five, four, three, and two inches ; and twelve were so lightly covered, that they were not perhaps at the depth of one inch. The sets were all from large roots of the same crop, and all as nearly as possible cut of the same size. They were all planted at the same time, in the first week of April, in a light dry soil ; and they all got the same quantity of dung ; and in every other circumstance were managed in the same manner. The plants at the depth of one and two inches appeared first ; but they were weak, and some of them curled. Those at three, four, and five inches were all strong, healthy, and entirely free of curl. At six and seven inches, they were also healthy and free of curl ; but they were three weeks later in getting above the ground than those that were thinly covered, and the plants neither so strong, nor the roots so large. Those planted at the depth of eight inches were still later in piercing the surface ; they were all weak, and nine out of the twelve were curled. Only four ever appeared of those planted ten inches deep ; and they were so weak, that they very soon withered and died. Of those placed at the depth of twelve, fourteen, sixteen, and eighteen inches, none ever appeared ; and on digging them up at the end of two months, those at sixteen and eighteen inches deep were found jult in the state in which they were planted, without any appearance of vegetation on any part of them ; while some of those at the depth of twelve and fourteen inches had put forth some feeble germs, none of them exceeding the length of an inch. Those planted at the depth of three and four inches were evidently the strongest plants during the whole season, and their roots largest. Those at five inches deep were nearly equally good ; but they were ten days later in appearing above the surface, and the stems never became so strong, nor the roots so large, as the others not so deeply covered. The writer is therefore convinced, from the result of this, as well as other experiments on the same subject, that about three inches is the best depth at which potatoes can be planted ; that the crop will be more or less early, abundant, and, in general, more or less injured with curl, according as the roots are placed at a greater or less depth than this. The result even of the same experiment, upon this point, may indeed be different in different sorts and seasons ; but he has much reason to think that in general it will be nearly the same.

“ VII. Whatever injures the new planted sets, or the germs afterwards, may produce curl : such as the sets being trampled upon and broken by the horses’ feet, in the time of planting ; particular sets being partially covered with

stones, or impenetrable clods of earth ; severe and deep harrowing, when the young shoots are advancing ; and grubs, snails, and other insects, destroying the germs at first, or the stems afterwards.

“ VIII. Some years ago, when on a journey, the writer observed a field with a greater proportion of curled potatoes than he had ever before seen, by which he was induced to inquire into the culture of the crop. The ground he found was stiff, and not having been sufficiently broken before the crop was planted, the farmer had passed a roller over it, about a fortnight after planting : the effect of which was, that many of the plants did not appear at all, and a very uncommon proportion of those that came forward were curled. This might in part be owing to the state and nature of the soil ; but, in a great measure, it seemed to depend upon the solidity given to it by the roller : for in the contiguous field, where the soil was exactly similar, the plants were more vigorous, and the curl not so frequent.

“ IX. The state of the weather, while the crop is young, has an obvious effect in rendering the curl more or less frequent. It does not appear that rain, in whatever quantity it may fall, has any effect, if it be not allowed to lodge, and if the soil is such as potatoes ought to be planted in, that is, a light pervious loam, with little or no tendency to clay. But we frequently find that a long continuance of dry weather, when the shoots first come forth, particularly when accompanied with severe cold winds, is very apt to produce curl. In the early state of the crop, too, frost seldom fails to produce it, particularly hoar-frost. This should lead farmers,” the writer thinks, “ to fix on that season for planting, in which they find from experience that their district of country is least liable to be injured by these causes, and chiefly by cold winds, frost, and a long continuance of dry weather. So far as the writer has observed, the first, second, or third weeks of April answer best for the south of Scotland, and north of England. Potatoes planted at this period do not appear till the middle or end of May ; after which, if it be not in low fields, contiguous to rivers or marshy grounds, in which hoar-frosts are frequent, they seldom suffer from frost ; at the same time that dry weather does not hurt them so much as it commonly does, when they do not appear till the middle of June, when, the heat and evaporation being more considerable, any scarcity of rain proves more particularly hurtful to all such plants as require a full supply of moisture, and which certainly is the case with potatoes, while the plants are young, and do not cover the ground. For although good potatoes cannot be raised on soils naturally wet, every farmer may observe, that nothing tends with more certainty to prevent curl, and produce vigorous perfect roots, than frequent showers in the early state of the crop. As a proof of the influence of winds on crops of potatoes, and in the production of curl, may be mentioned what the writer of this paper has several times observed, that, in the district of country in which he resides, where easterly winds commonly prevail during the months of April, May, and June, all such fields as are sheltered from this wind by high walls and hedges do not so readily produce curled potatoes as others commonly do. In two instances, in his own fields, it has happened, that the plants on these ridges immediately west of a stone-wall have been strong, and entirely free of curl, while the rest of the crop was poor, with several curled plants in every ridge, although the seed and culture were the same over the whole. The general result of all these observations,” the writer says, “ is, therefore, that the curl is not a disease, but only an accidental debility of those plants in which it occurs. We are not,” he thinks,

“ therefore,

“ therefore, to seek for a cure, or preventative, in a change of seed alone, as many have all along done, but in complete attention to all that experience shews to be necessary for an accurate culture of the crop; from which alone there is much reason to think, that this very useful article of life may be cultivated with the same success as before this dreadful enemy, the curl, made such havock in our crops. By proper attention to these observations, it is probable that this troublesome disease may in a great measure be removed.”

It has, however, lately been contended by others, that this affection of the leaves of the potatoe plant may proceed from the attacks of insects on the nutritive part of the set under ground, soon after it has been put in. This has been suggested as a cause, from the circumstance of having found some of the stems which came from a potatoe set very weak, and their leaves affected with the curl, while others from the same set were strong, vigorous, and free from the disease; and on the set being examined, its being discovered that the part from which the curled stems proceeded was wholly excavated, and the substance consumed by insects, while that portion from which the healthy stems came was perfectly free from their depredations. And in some cases it is imagined that the disease may arise from the leaves only, being attacked by numerous minute *animalcule*, without the substance of the set being hurt. The former is, however, suspected to be the much more general cause. The substance of the sets is found to be destroyed by insects of the snail, centipede, and beetle kinds.

And it has still more lately been supposed, by Mr. Knight, to be occasioned by moulding the plant; and that the method of preventing it is by permitting the potatoes to remain in a moderate state of heat, during the winter; and that the young shoots which appear in the spring should be taken off, when two or three inches in length, from the tuber, and planted out as sets, the plants from which will be perfectly free from the disease. From whatever cause this disease of the potatoe plant may, however, have its origin, there cannot be any doubt but that great benefit in preventing it may be derived, from having a nice attention to the preparation of the land on which it is to be planted, to the proper season of planting, and to having the culture of the crop afterwards well executed, as upon these much in all situations is found to depend. See POTATOE.

CURLEW, in *Ornithology*, the English name of the *arquata* or *numenius*, or *SCOLOPAX arquata*; which see. See also *SCOLOPAX phaeopus* and TANTALUS.

CURLEW *Mountains*, in *Geography*, are situated in the county of Sligo, Ireland, between Loughs Gara and Arrow, on the borders of the county of Roscommon.

CURLEW, *stone*, in *Ornithology*, a species of the *charadrius edicnemus* of Linnæus and Gmelin, the *pluvialis major* of Brisson, the thick-kneed bustard of Latham, and the Norfolk plover of Pennant. It is called *edicnemus* from its thick legs, with a remarkable swelling below the knee. Its specific character is, that it is grey, its two primary wing-quills are black, in the middle white; its bill is sharp, and its feet are cinereous. It is a migratory bird, appears in England about the middle of April, and retires in autumn. It is remarkable for a piercing shrill noise, which it begins in the evening, repeating the cries *túrrlui, túrrlui*, which re-echoe from hill to hill, during the months of September, October and November, in the provinces of Picardy, Orleans, Beauce, Champagne and Burgundy, in France; and as these resemble the articulated sounds of the curlew, it has hence been called the land-cowlew, or coulis de terre. It breeds in rabbit-burrows, and also lays its eggs, which

are two, of a copper colour, among the stones on the bare ground. It feeds in the night on worms and caterpillars, and it is said they will catch mice. Its flesh is esteemed very delicate food. In habit, make, and manners, this bird approaches near to the bustard. See OTIS.

CURLIGNANO, in *Geography*, a town of Naples, in the province of Otranto, 8 miles W. of Otranto.

CURMI, a name given by the ancients to a sort of malt liquor or ale. It was made of barley, and was drank by the people of many nations instead of wine, according to Dioscorides's account. He accuses it of causing pains in the head, generating bad juices, and disordering the nervous system. He also says, that in the western part of Iberia, and in Britain, such a sort of liquor was in his time prepared from wheat instead of barley.

CURMILIACA, in *Ancient Geography*, a place of Belgic Gaul, situated, according to the itinerary of Antonine, between Samacobriva and Cæsaromagus; corresponding to the present Corneille D'Anville.

CURNOCK, a measure of corn, containing four bushels or half a quarter. *Fleta*, l. ii. c. 12.

CURNONIUM, in *Ancient Geography*, a town of Spain, placed by Ptolemy in the Tarragonenian territory, in the country of the Vasconi.

CUROBIS or CURABIS, now *Gurba*, a town of Africa in Zeugitania, 7 leagues from Clybea, or ancient Clypea or Clupea. This is the Curobus of Ptolemy, who places it on the sea-coast near the promontory of Mercury, between the towns of Clypea and Neapolis, over against Sicily. It was formerly episcopal, and a considerable place; but at present the ruins of a large aqueduct, with the cistern that received the water, are the only antiquities which it affords.

CUROPALATA, or CURAPALATI, in *Antiquity*, an officer of the palace of Constantinople, to whom the care and ceremonies of the palace were entrusted. This officer occupied an illustrious rank in the age of Justinian, but was supplanted by the “Protovestiare,” whose primitive functions were limited to the custody of the wardrobe, from whence his jurisdiction was extended over the numerous menials of pomp and luxury; and he presided with his silver wand at the public and private audience.

CUROPOLIS, a town of Asia Minor in Caria.

CURRADI, CAV. FRANCESCO, in *Biography*, a Florentine painter, who was born in the year 1570, and studied under Batista Naldini. The churches and palaces of Florence possess many of his works, which, as he lived to the great age of 91, differ much from each other in point of style. One of his best altar-pictures is that of S. Saverio in the church of S. Giovanni. His works upon a smaller scale are much admired. Of this kind the gallery of Florence exhibits stories of Mary Magdalen, and the Martyrdom of S. Tecla, executed in his best style. Lanzi Stor. Pitt.

CURRAGH, *the*, in *Geography*, a celebrated common in the county of Kildare, Ireland, where there is a remarkably fine race course, and which is also used occasionally for encampments. It consists of above three thousand acres of a soft and verdant turf composing one uninterrupted lawn, varied only by the pleasing undulations of a few gentle hills. It was formerly covered with wood, and was sacred to religious purposes. It is near the town of Kildare, and affords pasture to an immense number of sheep. Beaufort. Robertson.

CURRAGHROE MOUNTAINS are situated in an angle of the county of Tyrone, Ireland, adjoining Donegal.

CURRAN, a town of Hindoostan, in the country of Allahabad; 30 miles N.W. of Allahabad.

CURRAN-Lough, a lake of the county of Kerry, Ireland, in the wild barony of Inveragh, the river issuing from which falls into Ballinaskellig's bay. It is of an oval form, 3 miles in length and about half as broad, and abounds with white trouts and salmon. There are some small islands, one of which are the ruins of a church and other buildings. Smith's Kerry.

CURRANT, in *Botany*, See RIBES.

CURRANT-Tree, in *Gardening*, is a small well known fruit tree or shrub, of which there are different species and varieties. See RIBES.

This useful fruit-shrub is said to have been brought from the isle of Zant, and planted in this country about the year 1533; and different sorts have since been introduced from Holland. In the different sorts of these kinds of fruit-bushes, there are different colours in the fruits which they afford; thus we have red, white, and black currants, as well as various shades of the red, from which circumstance, when the two first sorts are used at the table in mixture well arranged, they produce a very pleasing effect. From the juice of the red kind a jelly is prepared by boiling with lump sugar, which is much employed in sauces and other culinary purposes. And from the black kind a rob is frequently made, which is in high estimation by some as a simple remedy in cases of sore throat, and from the great use of the fruit in quinties, the produce has sometimes been denominated squinancy berries.

The produce of the red and white currant, besides being much esteemed as a table fruit, and for kitchen uses, is likewise valuable in febrile complaints from its grateful cooling effect on the stomach, and quenching thirst. It has also considerable restraining property; and the black sort is highly astringent; from which circumstance, and its strong disagreeable flavour, it is more rarely admitted to the table.

All the different kind of these trees are propagated with much facility by planting out cuttings made from the strong straight shoots, as well as by layers from the side branches; which, when they have become well rooted, should be removed in the autumn, or early spring months, into nursery rows, where they should be properly managed till they have attained a proper growth for being placed out where they are to remain for fruiting. In doing this they may either be put out as standards in rows, at four or five feet distance from each other, and six, eight, or ten feet apart in the rows, or be set out against walls or palings, to which they may be nailed, or trained as espaliers, in which latter methods they occupy less room, and afford finer fruit. Being trained horizontally they will require to have nearly the same distances as in the standard method, in these modes of planting them; the best season of doing which is in the early autumn. And they succeed the best in soils of a rich sandy quality which has been well trenched over to the depth of two feet, and well rotted dung put in, and where the situation is open.

These sorts of fruit bushes stand in need of a regular annual pruning, after they have arrived at the state of bearing fruit. They produce their fruit on the preceding year's wood as well as on studs or spurs. Therefore all the last year's lateral shoots should be cut off so as to leave only an eye or two on each, being careful not to rub off or injure the spurs; and the young leading shoot of each bearing branch should be shortened generally to about one-third of its length, but more or less according to the strength of the bearing branches in general. From the general luxuriant growth of the shoots of the currant, they mostly re-

quire considerable shortening. When the bearing branches become weak and unfruitful, they should be cut out, and strong young shoots be let come from the stem or roots to supply their places.

Thus, in the standards, by permitting the bushes to extend in height, only in a gradual manner, and keeping the bearing branches sufficiently thin, they produce better fruit, and in greater abundance; besides, the bearing branches become strong, and are not liable to be forced down to the ground by its weight. This way of pruning has also the advantage of enabling the bearing branches to throw out spurs on every part of them, so that fruit is afforded on every part of the bushes from the stem near the surface of the ground to the very extremities of the shoots, scarcely any portion being naked of a supply. See RIBES.

This is a sort of fruit which, by proper management in respect to situation, may be preserved much longer upon the plants than most others. In this view some should be planted against pales or walls which have a southern aspect, by which the fruit may become ripe more early, as in June; and others against northern fences of the same kinds, which, by being well protected from the early autumnal frosts, and well secured from birds by being covered with mats, may have their fruit continued hanging upon them until the end of October or longer; which is an advantage in respect to its culinary as well as other uses.

CURRANTS, in *Commerce*, a kind of little raisins, or dried grapes of different colours, black, white, or red; brought from several places of the Archipelago, and among others, from the isthmus of Corinth; whence their name, *currants*, q. d. *Corinths*.

They must be chosen new, small, and in large masses; and care be taken, that the little Spanish currants be not soiled in their room. When made up in bales, they may keep two or three years, without stirring, or giving them air. Their use is in seasoning several viands, and in some medicinal compositions; where they serve in lieu of raisins. Sir George Wheeler's account of these fruits, and the manner of preparing them, is very curious. The island of Zant, he observes, is the chief place whence currants are brought: the Morea, or the isthmus of Corinth, which was anciently the principal plantation, and whence the Latins denominated them *uvæ Corinthiaca*, now produces no more, as having been much neglected; the jealousy of the Turks not allowing large vessels to enter the gulph to take them off their hands.

They do not grow on bushes, like our gooseberries, though that be the common opinion, but on vines, like other grapes; except that the leaves are somewhat thicker, and the grapes somewhat smaller; they have no stone, and, in this country, are all red, or rather black.

They gather them in August, dispose them in couches on the ground till they be dry, clean them, and lay them up in magazines, which the natives call *seraglios*; pouring them in at a hole, till the magazine be full. They cling so fast together by their own weight, that they are forced to be dug out with iron instruments.

To barrel them for sending abroad they have people who grease their feet and legs, and tread them close, that they may keep the better. They are sold for about twelve crowns the thousand weight; and pay as much custom to the state of Venice.

Zant produces enough yearly to load five or six vessels; Cephalonia three or four; and the other islands one. The English have a factory at Zant; the Dutch two or three merchants, and the French one: the English consuming more than six times the quantity that both France and Hel-

land do together. Those of Zant know but little of the use we make of them; being persuaded they only serve in dyeing of cloth; and being entirely ignorant of the luxury of Christmas pyes, and English puddings.

CURRENT, COURANT OF CURRENT money, good money, or that which passes in commerce from one to another. See **COURANT**.

CURRENT accounts. See **BOOK, COIN, and PRICE**.

CURRENT, Currenato, also denotes a sort of running French dance; sometimes, a musical air in triple time. See **COURANT**.

CURRE, an English name for the fish called by authors *euculus*, and by us more frequently named the red gurnard. See **TRIGLA Cuculus**.

CURRENCY, in *Commerce*, denotes the coin or paper used in any country as a circulating medium for the purposes of commercial intercourse. See **CIRCULATION and PAPER-Money**.

CURRENT, Substantive, (from the Latin *currans*, running) denotes the progressive movement of any thing; but it is chiefly applied to the progressive movement of fluids, especially of air, of electricity, and of water.

Currents of Air.—The various movements of the air have obtained a variety of specific names under the generic appellation of winds, and these names are principally derived from the velocity, direction, and duration of the movements. Hence we have the names breezes, gales, trade winds, monsoons, &c. A peculiar movement of the air is likewise the principal propagator of sound; though not the only one; for sound is also propagated through solids. But the difference between wind and sound is, that the former consists in a progressive motion of the air from one place to another; whereas sound is propagated and conveyed from the sonorous body to the ear, by means of a vibratory motion of the air, the particles of which, in that case, move a very little way backwards or forwards, from their situations, and at the end of every other vibration, are to be found precisely at their original places. See the article **SOUND**.

The winds generally owe their origin to the rarefaction or condensation of the atmospherical fluid; and, in the strict sense of the word, they actually are currents of air; yet the last denomination has been peculiarly applied to a constant and general movement from east to west, which the air of our atmosphere has been observed to have; but the nature of this current, as well as the probability of other aerial currents, being intimately connected with the common winds, the whole will be examined under the article **WIND**.

Currents in Electricity. The extensive and wonderful phenomena of electricity exhibit two powers diametrically opposite to each other; and it seems, that if it were not for the mutual opposition of those two powers, hardly any electrical effect would take place. By friction and other means several bodies are electrified, or have an electric power excited in them, which power is conveyed from the excited body to another, through certain substances, which are therefore called *conductors*; but it is not conducted by other substances, which, therefore, are called *non-conductors* of electricity. When glass is thus excited by friction with the human hand, and a pointed metallic wire is presented to it in a dark room, a small luminous spark, nearly globular, will appear on that point. When a lick of sealing-wax, or of resin is excited by the like means, and the pointed wire is presented to it, a pretty long luminous brush, nearly of a conical form, will be seen with its apex touching the point of the wire. These appearances are the distinctive characteristics of the two electric powers, one of which has thereby

been called the *vitreous*, and the other the *resinous* electricity. Another very remarkable distinction is, that if two or more bodies are possessed of the same kind of electricity, viz. either of the vitreous or of the resinous, and are freely suspended by means of flexible nonconductors within a certain distance of each other, they will manifest a considerable degree of repulsion; but if one or more bodies be electrified with the vitreous, and an equal number of similar bodies be equally electrified with the resinous electricity, and all these bodies thus differently electrified be brought within a certain distance of each other, a powerful attraction will be observed between the same, which brings them into contact, and as soon as they touch, every appearance of electricity will vanish. It is farther to be observed, that these two opposite electrical powers always appear together, or the one cannot exist without the other; for instance, if a body be electrified with the vitreous electricity, then the other bodies, or the air which is contiguous to it, will of course acquire the resinous power, and *vice versa*. If one of these powers be communicated to one side of a plate of glass, the other side will naturally acquire the other power. Upon an attentive consideration of these phenomena, and of others of a similar nature, two principal theories have been formed, besides several others, which, being evidently defective or absurd, are at present entirely disregarded. One of these theories supposes that there are two distinct electric fluids; viz. the vitreous and the resinous. Each of these fluids is attractive of the other, but itself elastic, that is, its own particles repel each other, hence bodies possessed of different electricities attract each other. The other theory, which goes under the name of the Franklinian theory, supposes that there is only one electric fluid whose particles repel each other, but they attract every other kind of matter; in consequence of which this fluid is dispersed throughout the universe, and every body possesses a certain quantity of it. According to this hypothesis, when a body is excited, either an additional quantity of electric fluid is accumulated upon it, which must have been taken away from other bodies, or a portion of its natural quantity has been abstracted from it. In consequence of this supposition the two electric powers have been called the *positive* and the *negative* electricities; the positive answering to the vitreous, and the negative to the resinous powers. Now both these theories have been so well adapted to the phenomena as that either of them is sufficient to account for the phenomena of electricity, excepting, however, those of one kind; namely, of those experiments which manifest an evident current from the positive or vitreous, to the negative or resinous power; for these results can only be explained upon the Franklinian hypothesis of a single electric fluid. Therefore, in the present article it is incumbent upon us to point out the nature of electrical currents, briefly describing the principal of those experiments which shew the direction of these currents in a clear and decided manner; and it is for the purpose of elucidating the nature or the dependance of these currents, that the above short statement of the leading phenomena of electricity has been premised.

Two sorts of electrical currents must be remarked. One sort consists of those which move in the same direction, whether they be caused by the vitreous or by the resinous electricity. The currents of the other sort are those which always proceed from the vitreous or positive, and run towards the resinous or negative power.

If a pointed metallic body proceeds from an electrified prime conductor of an electrical machine, and the face or the hand be presented to it at the distance of a few inches, a slight but perceptible wind will be found to proceed from the

point; and this is the case whether the prime conductor be electrified positively or negatively. The cause of this result is, that bodies possessed of the same kind of electricity, repel each other; for as soon as each particle of air, contiguous to the pointed body, has received some electricity from the point, it is immediately repelled by it, and other particles succeed, which are electrified in their turn, and are immediately repelled; hence a continual current or wind proceeds from the point. This effect may be rendered still more evident by presenting the flame of a candle to the point, for this will be always blown from it. The same effect takes place when the electrical fly (*viz.* a little apparatus of metallic wires, see *Electrical Fly*) is used; *viz.* the fly will always turn the same way, whether it be electrified with the vitreous or with the resinous electricity; for the wind which proceeds from each point of the fly, produces a counterpressure which impels the fly the contrary way.

If the wire at the end of the prime conductor be furnished with a brass ball of about three quarters of an inch in diameter, and whilst the machine is in action, the flame of a candle be presented to it, this will be blown from the ball when the prime conductor is electrified with the vitreous or positive electricity, and towards the ball when the prime conductor is electrified with the resinous or negative power. The result of this experiment is evidently in favour of the Franklinian theory of a single electric fluid. It may, however, be asked why the flame of the candle is blown towards the wire when the ball is upon it in the latter case, and from it when it terminates in a point? The answer is, that the electricity which proceeds from the point, being incomparably more copious than that which proceeds from the ball, electrifies the air contiguous to it, and produces a current of it which counteracts the direction in which the mere afflux of electric power would impel the flame. In the performance of this experiment care must be had not to use a ball too large or too small; the action of the machine must, likewise, be regulated in a manner suitable to the size of the ball. But with respect to these particulars, experience alone can instruct the operator.

Place a lighted piece of wax-candle between the knobs at the ends of the wires of the universal discharger, (see *Universal Discharger*) so that the flame may stand midway at the distance of about one inch from each knob. Then connect one of those wires with the outside coating of a charged electrical jar, and touch the other wire with the knob which communicates with the inside-coating of the jar; and thus on making the discharge which must pass from one wire to the other, through the flame of the candle, it will be found that the flame is always driven in the direction of the electric fluid, that is, it will be blown upon the knob of that wire which communicates with the negative side of the jar. For this experiment the jar must contain an exceedingly small charge, *viz.* just sufficient to pass through the interval in the circuit, which experience will readily determine; otherwise the experiment will not succeed. If it be asked why this experiment does not succeed with a great charge as well as with a very small one? The answer is, that when the jar is highly charged, and is brought near one of the wires of the universal discharger, it creates an atmosphere about the knob of that wire which disturbs the flame of the candle, before the discharge actually takes place. Besides, the electric fluid in a great explosion, being actuated by its great elasticity, which is proportionate to its condensation, passes through the flame of the candle too swiftly to communicate any distinct motion to it, in the same manner as when a bullet is discharged from a gun against an open door,

which makes a hole through the door without shutting it.

Bend a card in the form of a half cylinder, *viz.* so as to form a semi-circular groove. Lay it upon the circular board of the universal discharger, and place a pith-ball of about half an inch in diameter in the middle of it. Let the two brass knobs on the wires of the universal discharger be disposed so as to stand on each side of the pith-ball at the distance of about three quarters of an inch from it. The card must be perfectly dry and rather hot. Now, if you connect one of those wires with the outside of a charged jar, and touch the other wire with the knob of the jar, the charge will be sent from one wire to the other, along the channel in which the pith-ball is situated, and this will be found to be driven from the positive to the negative side. In this experiment, also, the charge of the jar must be very low, the card must be very clean and dry, also the distance of the brass knobs from the pith-balls must be nicely adjusted, otherwise the experiment is apt to fail.

Let a card be laid upon the circular board or tablet of the universal discharger, and place the pointed wires of the same so that one point may touch the upper, and the other may touch the lower surface of the card. Let the interval between these extremities of the two wires be about one inch; then send the charge of a pretty powerful jar through those wires, in the same manner as directed in the preceding experiment, and it will appear from the luminous track, that the electric fluid runs over that surface of the card which touches the wire that communicates with the positive side of the jar, and in order to pass to the extremity of the other wire, it breaks a hole through the card just over the extremity of that other wire, which is connected with the negative side of the jar.

The last experiment which we shall mention must be performed with an electrical battery, or at least, with three or four large jars connected together. When the charge of such a battery is sent through a slender wire of any metallic substance, and of a considerable length; *viz.* of a foot or upwards, the discharge generally melts and disperses either part of the wire, or the whole of it; but if the charge of the said battery be diminished, so that the discharge be just able to render the wire red-hot, without actually melting it, then it will be found that the redness appears first at one end of the slender wire; *viz.* that which communicates with the positive side of the battery, and thence proceeds successively to the other end of the wire. This result is an ocular demonstration of the theory of a single electric fluid. Indeed the wire is not rendered red-hot at one end before the other, in consequence of the electric fluid passing first through the former, and then through the latter; that difference of time being by far too small to be observed; but, because the electric fluid loses part of its impetus or velocity, in going through the wire; so that the extremity of the wire which the electric fluid enters at, suffers the greatest effect of the shock, and, of course, becomes red-hot sooner, in a greater degree than the rest.

CURRENTS, in *Hydrography*. Two movements of different kinds have been observed, by which the waters of the sea are impelled in some horizontal direction from one spot towards another; namely, *tides* and *currents*. The motion of the waves when the wind prevails, seems to urge the water in the direction of the wind; but in truth they do not; they only raise and depress the water of the same spot alternately. (See *WAVE*.) The action of the wind, however, undoubtedly urges the waters in its direction; but that movement is so very slow, as hardly to be perceived,
even

CURRENT.

even in a pretty hard gale; for instance, if a man on shore fixes his sight on a piece of wood floating at the distance of about a mile, he will find that the piece of wood rises and falls alternately, according as the waves do; but its motion from that spot will perhaps not exceed a quarter of a mile in an hour; and such is nearly the motion of the waters which surround the floating piece of wood.

The difference between tides, and currents properly so called, is, that the former follow, with alternate rising and falling, the daily motion of the moon, and, likewise, in some measure of the sun; whereas the currents continue in one direction much longer. As both the tides and the currents are matters of the utmost consequence in navigation, no pains have been spared to examine, and to investigate the causes of all the various phenomena which attend them; such as, their periods, their velocities, their directions, the places in which they prevail, and so forth. The observations of navigators, the experiments and the calculations of philosophers, on this interesting subject, are very numerous; and, though they have not as yet been able to form a general theory sufficient to account for all the phenomena; yet it must be acknowledged, that they have furnished the present generation with much useful information, which is daily deriving additional lights from the assiduity of numerous able and industrious observers.

The tides, which are rendered more apparent on the coast, by their flowing and ebbing, depend principally on the attraction of the moon, but in some measure also upon the attraction of the sun; for when those two celestial bodies happen to be in the same direction, the tides are sensibly greater than when the moon alone acts upon the waters of the sea, which is the case when the sun is at some apparent distance from it. "Every day, about the time of the moon's passing over the meridian, or a certain number of hours later, the sea becomes elevated above its mean height, and at this time it is said to be high water. The elevation subsides by degrees, and in about six hours it is low water, the sea having attained its greatest depression; after this it rises again when the moon passes the meridian below the horizon, so that the ebb and flood occur twice a day, but become daily later and later by about $50\frac{1}{2}$ minutes, which is the excess of a lunar day above a solar one; since $28\frac{1}{2}$ lunar days are nearly equal to $29\frac{1}{2}$ solar ones." Thus much concerning the tides has been thought necessary to be inserted in this place, for the purpose of making a proper discrimination between them and the currents; but the full account of the numerous and interesting particulars relative to the former, will be found under the article *TIDE*.

CURRENTS at Sea, are progressive movements of the waters, which carry vessels, or any thing floating upon them, in their directions, and precisely with their own velocity, when no wind prevails; or, if any wind acts upon the vessel, the current will increase or check its rate of going, according as the wind happens to blow with, or contrary to its direction. Hence, in reckoning the ship's run, due allowance must be made for the action of currents.

The currents do not, like the tides, change their directions after the lapse of a few hours; yet some of them run one way during a few days; others continue a few months in one direction, and then alter their course, or vanish altogether, whilst others run continually the same way. The extent of currents, their breadths, their depths, and their velocities, are also various, and often fluctuating. Some, for instance, run along immense tracts, and spread a vast way, whilst others are observed close to some particular coast or strait, and not farther. Some reach very deep, and others are very superficial. The velocities of some cur-

rents are remarkably great; but in general when the periodical currents are near the period of their termination, they generally slacken their pace.

Currents are either *general*, *particular*, or *variable*.

General currents are those which are always directed towards the same point of the compass.

Particular currents shift from one direction to its opposite in the course of about six months.

And variable currents are those which have no stated period, and are generally affected by the wind; one twentieth part of the velocity of the wind being equal to that of the current.

There are also upper and under currents; that is, the waters at the surface move in a contrary or oblique direction to those at the bottom. And there are currents at the surface, at no great distance from each other, which move in opposite directions.

The principal current of the aqueous part of our globe is observed in its broader and more exposed surface. Its general direction is from the east towards the west; viz. contrary to the motion of the earth in its diurnal revolution. This current comes from the Pacific and Indian oceans, round the Cape of Good Hope, along the coast of Africa; thence it passes over to America, where it divides itself into two branches, one of which is reflected southward, toward the coasts of the Brazils, and the other northward, into the gulf-stream (see *GULF-STREAM*), which proceeds round the Mexican gulf, advances north-eastward in the vicinity of Newfoundland, after which it probably returns eastward and south-eastward, crossing the Atlantic once more. "The atmosphere also seems affected by a general current from east to west, like that of the sea; and there is reason, from astronomical observations, to suppose that a similar circumstance happens in the atmosphere of Jupiter, on account of the actions of his satellites, which must be considerably more powerful than that of the moon."

"These currents," Dr. Th. Young observes, "as well as the general current of the sea, have been attributed, by some astronomers, to the immediate attractions of the sun and moon, and of the satellites of Jupiter, which they have supposed to act in the same manner as the attraction of the sun operates in retarding the lunar motions. But the fact is, that according to Mr. Laplace, the disturbing force of the sun produces this effect on the moon only in proportion as it increases her distance from the earth; consequently, no such retardation can possibly be produced by the force of gravitation in the rotation of the sea, or of the atmosphere, and the whole effect must be attributed to the operation of meteorological causes, producing first the trade winds, and secondly occasioning, by means of the friction of those winds, a similar motion in the sea."

Another remarkable constant current is that which runs from the Atlantic into the Mediterranean, through the straits of Gibraltar; a channel of about seven leagues. The velocity of this current is in some measure influenced by the state of the winds, according as they may either conspire with, or blow against it. However, its ordinary velocity, at the narrowest part, is about two miles an hour; but this velocity slackens as soon as the channel becomes wider, and soon after disappears. It is said that at the sides, and especially on the south side of the Straits, there is a current outwards. (Phil. Trans. vol. xxxiii.) It has likewise been asserted that the currents run in contrary directions on the opposite coasts. (Phil. Trans. for 1762.) And Mr. Robison says that the current sometimes runs outwards in the middle of the Straits. It appears, however, from the constant observations of mariners, that if any such outward currents do

really

really exist, the breadth of that which runs into the Mediterranean is incomparably larger than the former. Now the question is, what becomes of that immense quantity of water which thus continually runs into the Mediterranean, which sea has no other visible communication with the ocean? A variety of conjectures have been offered in explanation of this remarkable phenomenon; and though some of these conjectures are attended with an appearance of probability, yet we are by no means possessed of a clear and satisfactory theory concerning it. We shall briefly state the principal hypotheses respecting this question, together with the reasons by which they seem to be supported or invalidated. But previously to this, it will be necessary to mention certain facts of importance in the present case. The straits of Gibraltar are unfathomable; hence the depth of the water must at least exceed one mile. The surface of the Mediterranean seems to have remained at the same level during at least a century or two; nor are the low lands on the coast of Africa, or elsewhere, ever overflowed. But between the present time and a remote antiquity, *viz.* a period of about 2000 years, the rising of the water a few feet has been deduced from the following documents. The floor of the cathedral of Ravenna is at present several feet lower with respect to the sea, than it is supposed to have been formerly. Some steps have been found in the rock of the island of Malta, apparently intended for ascending it, which at present remain under water. In the bay of Naples, and on that part of the coast which is nearest to the famous grotto of Posilipo, vestiges of several ancient houses are at present visible under water, which formerly must undoubtedly have been out of it. The like thing is also to be observed on several other parts of the coast. Yet a considerable degree of uncertainty is thrown upon the evidence of these documents, by other observations. Thus in the bay of Puzzuoli, near the city of Naples, the ancient piers of massive stone which have resisted the efforts of about 2000 years (whether they belonged to the bridge of Caligula, as tradition says, or to a mole which was intended for the protection of the Roman galleys) seem at present to remain at such an height above the surface of the water, as might have answered either of those purposes. Since the rising of the level of the water in the Mediterranean has not been perceived within this century or two, and considering all the above-mentioned facts, it will be difficult to determine whether the level of the sea has risen a few feet in the course of eighteen or twenty centuries; or the ground has subsided in some parts of the coast in consequence of earthquakes, and other causes. It is lastly to be observed, that the specific gravity of the Mediterranean waters is a little greater than that of the Atlantic water, indicating the presence of a little more salt in the former than in the latter, which may be naturally expected, considering that the waters of the Mediterranean are surrounded by a proportionably greater extent of coast than those of the Atlantic.

One of the conjectures concerning the disposition of the water, which is continually brought into the Mediterranean by the current of the Straits, is, that there is an aperture, or passage, at a considerable distance below the surface of the ground, which joins the Mediterranean with the Red Sea; so that the water, which enters the Mediterranean through the Straits, runs out of it through the above-mentioned passage. This conjecture, however, being not established upon any actual facts, is not likely to prove very satisfactory. Another conjecture is, that the influx of water is carried away by evaporation, considering the solar heat to which the Mediterranean is exposed; and so Dr. Halley is inclined to think. It has been calculated, that in one

summer's day about 5280 millions of tons of water are, in all probability, evaporated from the surface of the Mediterranean. It has also been calculated, (admitting the great uncertainty to which such calculations are liable,) that all the rivers, or at least the nine principal ones, which discharge their water into the Mediterranean, do not furnish more than 1527 millions of tons of water a day. (Phil. Trans. N^o 212.) The deficiency then is supposed to be supplied by the rain, and by the current from the Atlantic. But, since the vapour of sea-water does not take up any saline particles, it follows that the Mediterranean sea, after so many centuries of evaporation, which leaves the saline particles behind, and of influx by the current, which introduces salt and water, would by this time have almost been converted into a solid rock of salt; which is by no means the case. The last hypothesis we shall mention, and which, upon the whole, seems to be the most probable, is, that at the Straits of Gibraltar there are two currents in different directions, one above the other; *viz.* that a current runs into the Mediterranean at the surface, and to a certain depth, whilst another current runs out of it near the bottom; which, considering that the evaporation continually tends to increase the specific gravity of the Mediterranean waters, may take place in consequence of that circumstance; "for the same reason," Dr. Thomas Young observes, "as the air, when it is denser in a passage than in the adjoining room, blows a candle towards the room at the lower part of the door, and draws it towards the passage at the upper."

The probability of the existence of two opposite currents, one above the other, in the Straits, is corroborated, first, by this hypothesis answering to the phenomena better than any other supposition; and, secondly, by the observation, that opposite currents, one below the other, have been actually found to exist in other parts of the sea. Thus, in support of the above-mentioned lower current, Dr. Smith, in the 14th volume of the Philosophical Transactions, relates an experiment made in the Baltic Sound, which was communicated to him by an able seaman, who was present at the making of it. Being at that place with one of the king's frigates, they went with their pinnace into the mid-stream, where they were carried away violently by the current. Whilst thus running with the current, they sunk a basket with a large cannon-ball to a certain depth of water, by which means the boat's motion was checked; but by sinking the basket still lower and lower, the motion of the boat was checked more and more, until at last it was driven a-head to the windward, against the upper current, which seemed to reach not lower than about four or five fathoms. He added, that the lower the basket was sunk, the stronger the under-current seemed to be. Dr. Smith derives another argument in favour of an under-current at the Straits, from the ebbing between the north and south Foreland, where it runs tide and half tide; *viz.* it is either ebb or flood in that part of the Downs three hours before it is so off at sea: a certain sign that, though the tide of flood runs above, the tide of ebb must run below, *viz.* close to the ground; and so at the tide of ebb it will flow close to the ground.

A remarkable current exists in the Atlantic, about the coast of Guinea, which runs from the west towards the east, in a direction contrary to the general motion of the sea, from Cape Verd towards the curvature or bay of Africa. This current, which is known by the name of "Fernando Poo," is said to be so strong as to impel vessels powerfully towards the bay, when they happen to come too near the coast. Its strength is such that a vessel may, in two days, go from Mavra to Rio de Beuin, distant 150 leagues; and the time required

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required to return is often about six weeks. From Cape Spartelle to Sallee a current sets nearly according to the trend of the coast; and from thence it inclines towards the west.

Of the currents, which may be properly called partial and shifting, a vast number have been observed, and new ones are met with in different parts of the world, by attentive navigators. They are generally occasioned by the monsoons and other winds, or by the peculiar configurations of promontories, straits, coasts, gulfs, &c.: for the water, which, by the continuance of the wind in a certain quarter, is driven against bays, gulfs, straits, and the like, must run off some way or other, and must thus produce a current or two, which last no longer than the cause continues to act.

“At Java, in the straits of Sunda, when the monsoons blow from the west, *viz.* in the month of May, the currents set to the eastward, contrary to the general motion.

“Also, between the island of Celebes and Madura, when the western monsoons set in, *viz.* in December, January, and February, or when the winds blow from the north-west, or between the north and west, the currents set to the south-east, or between the south and east.

“At Ceylon, from the middle of March to October, the currents set to the southward, and in the other parts of the year to the northward; because at this time the southern monsoons blow, and at the other the northern.

“Between Cochinchina and Malacca, when the western monsoons blow, *viz.* from April to August, the currents set eastward, against the general motion; but the rest of the year set westward: the monsoon conspiring with the general motion. They run so strongly in these seas, that unexperienced sailors mistake them for waves that beat upon the rocks, known by the name of *breakers*.

“So, for some months after the 15th of February, the currents set from the Maldives towards India on the east, against the general motion of the sea.

“On the shore of China and Cambodia, in the months of October, November, and December, the currents set to the north-west, and from January to the south-west, when they run with such a rapidity of motion about the shoals of Parcel, that it seems swifter than that of an arrow.

“At Pulo Condore, upon the coast of Cambodia, though the monsoons are shifting, yet the currents set strongly towards the east, even when they blow to a contrary point.

“Along the coasts of the bay of Bengal, as far as the cape Romania, at the extreme point of Malacca, the current runs southward in November and December.

“When the monsoons blow from China to Malacca, the sea runs swiftly from Pulo Cambi to Pulo Condore, on the coast of Cambodia.

“In the bay of Sans Bras, not far from the Cape of Good Hope, there is a current particularly remarkable, where the sea runs from east to west to the landward; and this more vehemently as it becomes opposed by the winds from a contrary direction. The cause is undoubtedly owing to some adjacent shore, which is higher than this.” Varenus.

It is said that a current runs towards the east in St. George's Channel, in consequence of which some ships have been driven by it so far from their intended course, as to enter the English, instead of the Bristol, Channel. (Phil. Trans. vol. xxii.) There is reason, however, to suppose, that this mistake arose from their not accurately knowing the variation of the magnetic needle in those parts.

A current is said to prevail on the western coast of Scilly, which is supposed to come out of the Bay of Biscay, to-

wards the N.W. by W., in consequence of the westerly winds of the Atlantic.

Near Sumatra there are some rapid currents, which run from south to north, and which, according to Buffon, have probably formed the gulf which is between Malay and India. Between the eastern coast of Africa and the island of Madagascar, particularly between Terra de Natal and the Cape of Good Hope, upon the African coast, there are very considerable currents. In the Pacific ocean, on the coast of Peru, and other parts of the American coast, the current sets from south to north: a direction which appears to be occasioned by a wind which constantly blows from the south. This is also the case with the current upon the coast of Brazil, from Cape St. Augustine, as far as the Antilles.

In the sea bordering on the Maldivé islands, and between them, there are very strong currents, which run constantly during six months from east to west. They follow the course of the winds, and are probably produced by them. See Buffon's Nat. Hist.

Between Jamaica and Cuba the currents run towards the W.; and at Cape de Croix, towards the N.W.; but on the Caimanes, towards the N. and N.E., to fall in with the small channels of the Jardines; and by the Isle of Pines, they set to the S.W., till they come to Cape de Corrientes; and from thence to the W.N.W. and N.W., and by the coast of Apalachi, they return to the E. and E.S.E. and S.E., at the edge of the Soundings, near Tortugas; and from thence run towards the E. to fall into the channels of Bahama, according to their situation.

The strongest currents of the waters are in the gulf of Florida, where they run to the N., until they come out at the cape of Canaveral; and from thence they set towards the N.E., losing much of their force and strength near Bermudas.

By the north side of Cuba the current sets from Cape Mayfi, towards the N.W., and through the old straits of Bahama, to the W.N.W. with a small stream; but coming to the point of Hicacos, it runs to the N. and N.E. to fall in with the other channels; and from the port of Cavannas it runs to the E. and E.N.E., sometimes violently into the said channels; but from Cavannas, towards the west part of the coast, the current alters its course, and runs to the S.W. to fall in with the little channels of St. Isabel or Colorados. With the north and land winds the current sets into the aforesaid gulf, and along the coasts of Havana and Florida, in the same manner as with the trade-winds. Upon the coasts of Caraccas, Venezuela, Maracaiibo, and St. Martha, the currents set with the trade-winds, towards the W. and W.N.W. With the land winds the currents are in general strong, especially on the coast of St. Martha; but during the time of the north wind, the currents become weak. In the channel between Cape St. Nicholas, in the island of Hispaniola, and Cape Mayfi, in the island of Cuba, the current sets towards the N.W. and W.N.W.; and those currents that fall in with the south coast of the above-mentioned cape run along it, towards the west, by the coast of Cuba; and those that take their course by Cape St. Nicholas, on the land side, run towards the east, and fall in between the coast and the island Tortugas. From thence they steer a course between the N. and N.W., in order to fall into the channels formed by the islands and shoals to the northward of the islands of Cuba and Hispaniola, &c. In the bay of Piliquao, the current runs in eddies with a slow motion; and along the north and south coasts of Hispaniola, the current sets with the trade-winds towards the west; and on the north coast, its direction is towards

towards the north-west. On the eastern side of the above-mentioned islands, the currents run in very contrary directions, particularly in the bay of Samana; on the Virgin islands, and Porto Rico, the current sets towards the west with the trade-winds; and along Puffin, runs towards the N.W.; and in the westernmost part of the island of Porto Rico, the currents are changeable, inclining more towards the W.N.W. as they run to the bay of Samana.

Captain Vancouver observes, that from the island of St. Antonio, one of the Cape Verd islands, till crossing the latitude of St. Augustine, (perhaps the cape so called on the coast of Brazil, in lat. $8^{\circ} 48' S.$) were material currents; and from 6 degrees of N latitude to the equator, strong ripplings. But they were irregular in direction, and not uniform, as Mr. Nicholson states in his Indian Directory of 1787. Our current was not northward, as he states, but southward, or south-east. Mr. Vancouver also disapproves his notion of finding longitude by the variation of the compass: for these observations, though made with the greatest care, says he, differ from one to three, or even four degrees from each other.

Other authorities state, that in the long. $26^{\circ} 16' W.$ upon the line, a current has been found to set N. by E. half a knot an hour, and to continue nearly so for a month's sail or more to the northward. It afterwards begins to set to the southward of west. But in the long. of $9^{\circ} 25' W.$, scarce a degree N. of the line, a current has been found setting N.E. eight knots in 24 hours, making an error in reckoning from St. Jago of 3° more to the east than by account. After crossing the line, the S.E. trade-wind seems to set the current westward, as a ship will then outstrip her reckoning. Perhaps these currents have been less attended to, because, in this track, they commonly balance each other to the Cape of Good Hope.

M. de la Perouse remarked, after leaving Easter island, in April, 1786, that a current set toward the Sandwich islands, at first about 3 leagues in 24 hours, making a degree to S.W. It then changed to east at the same rate, till in $7^{\circ} N.$; after that to the westward. Hence the longitude by account was 5° too far east, on arriving at those islands; and hence the Los Mejos, La Mafa, La Diogra, Ciada, &c. of the Spanish charts, probably no other than the Sandwich islands, have from these currents been laid down too far easterly. He found also on the North American coast uncommonly strong currents, about the latitudes of 46 and 47 degrees.

The following notices of currents were also made in the course of captain Vancouver's voyage. He found that in passing through the Atlantic ocean, in going towards the equator a current set 6 miles to E.N.E. in 24 hours, when he was arrived in lat. $42^{\circ} 34' N.$ and long. $12^{\circ} 31' W.$ After passing the island of St. Antonio, the currents became extremely variable and uncertain. After passing the southern tropic, he found, on arriving at the parallel of $38^{\circ} 26'$ of S. lat. and in long. $43^{\circ} 43' E.$, that a current had set the ships 26 miles to the north of their reckoning. When he was on the coast of New Holland, near King George's Sound, in lat. $35^{\circ} 5' S.$ and long. $118^{\circ} 17' E.$ he concluded that the current set eastward. When he had entered the North Pacific ocean, and had reached the north-west American coast, he observed that a current set northward half a league in an hour, (perhaps a mistake in printing, or transcribing, for half a mile,) which set the ship 10 or 12 miles daily to the north of her reckoning. On returning southward, he noted also that a current set westward, when he was in latitude $9^{\circ} 27' N.$ and long. $96^{\circ} 24' W.$

Captain Cook observes as follows: "From the time of our leaving that island (Teneriffe) till the 15th August, being then in lat. $12^{\circ} N.$ and long. $24^{\circ} W.$, the ship was carried $1^{\circ} 20'$ of longitude to the westward of her reckoning. At this station the currents took a contrary direction, and set to E.S.E. at the rate of 12 or 14 miles a day, or 24 hours, till we arrived in the latitude of $5^{\circ} N.$ and longitude of $20^{\circ} W.$, which was our most easterly situation after leaving the Cape Verd islands, till we got to the southward. For in this situation the wind came southerly, and we tacked, and stretched to the westward, and for two or three days could not find that our reckoning was affected by any current; so that, I judged, we were between the current that generally, if not constantly, sets to the east upon the coast of Guinea, and that which sets to the westward of the coast of Brasil.

"The westerly current was not considerable till we got into $2^{\circ} N.$ and $25^{\circ} W.$ From this station to $3^{\circ} S.$ and $30^{\circ} W.$ the ship, in the space of four days, was carried 115 miles in the direction of S.W. by W. beyond her reckoning: an error by far too great to have any other cause than a strong current running in the same direction. Nor did its strength abate here: but its course was afterwards more westerly, and to the north of west; and off Cape Augustine, north, as I have already mentioned. But this northerly current did not exist at 20 or 30 leagues to the southward of that cape, nor any other, that I could perceive, in the remaining part of the passage." He farther observes, (vol. iii. p. 479.) "that from the 21st of March, when we were in latitude $27^{\circ} 22' S.$ long. $52^{\circ} 25' E.$, to the 5th of April, when we got into latitude $36^{\circ} 12' S.$ long. $22^{\circ} 7' E.$, we were strongly affected by the currents, which set to the S.S.W. and S.W. by W., sometimes at the rate of 80 knots a day."

It was also observed by sir Erasmus Gower, captain of the Lion, on an embassy to China, which left England in September, 1702, that all vessels from England to Madeira will discover their way is affected by a current from the western ocean into the bay of Biscay, and also into the Mediterranean. He supposed, on an estimate from five voyages, that it set S.E. about 11 miles in 50 leagues. From the Madeiras to the Canaries a current was observed to set southward, about 22 miles in the whole run of 66 hours, or 1 mile in 3 hours. But captain Mackintosh of the Indostan, on an estimate of 20 voyages, states a current from the 39° of latitude to the Canaries, which sets $3^{\circ} 25'$ E.S.E. It is strongest opposite the Straits of Gibraltar, and it once appeared to set 40 miles a day. Near the Canaries it was more southerly; but on the coast of Africa, near Cape Bajadore, in lat. $26^{\circ} N.$, it strikes the shore, and goes one way northward for the Mediterranean, and the other southward for the coast of Guinea. From Rio Janeiro, on the coast of Brazil in South America, a small current sets all the way towards the S.E. till it comes within about 4° of longitude W. from the Cape of Good Hope; but from about $3^{\circ} W.$ to $3^{\circ} E.$ of the same cape, a counter current sets strongly to the westward. On the coast of Cochinchina a current constantly sets from the eastward, or eastern Indian ocean, towards the land, between the Paracel's islands and the large island of Hai-nan, into the gulf of Tonquin. Whilst the ships, after leaving Turon, ran 100 miles to the N.E. in 24 hours, a current drove them 30 miles to the N. $67^{\circ} W.$ The water which returns to those shores is too weak to counteract the constant eastern tide, and is consequently forced northward along the coast into that gulf. Here the tides are, from these causes, very strong and high. Farther to the northward, the reflux from

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the east coast of the island of Hai-nan occasions a current to the N.E.; but still farther to the northward, it again sets in from the eastward, nearly in the parallel of the northern channel of Hai-nan, about 13 miles in 24 hours. But about the lat. of 22° N. in the long of 114° , or upwards, not far from the coast of China, a current was found to set N. by E., about a mile an hour for 24 hours.

Having thus stated the most known currents, it now remains for us to shew how the existence of a current, and the velocity of it, may be ascertained; for though the time of the setting in and duration of most currents have been examined by various attentive navigators, yet both their durations and their velocities are influenced by a variety of meteorological circumstances. Besides, it frequently happens that a new current is met with in particular seas, of which no mention is made in any book on navigation. Hence it is highly necessary for the mariner to know the best method of observing the existence and the velocity of a current, in which he actually is, or expects to be. If the ship is near the coast, so as to ride at anchor, both the direction and the velocity may be readily ascertained by casting the log, and looking at the compass. But when the sea is too deep, and the ship is under fail, the method which has been found more efficacious by the mariners is as follows: a common iron pot, capable of containing four or five gallons, is fastened to a small rope, which must be tied to its handles, so that, when suspended, the aperture of the pot may remain upwards and horizontal. The rope, which may be from 70 to 100 fathoms in length, is to be coiled in the boat, which is hoisted out of the ship at a convenient opportunity; *viz.* when there is little or no wind to ruffle the surface of the sea. The pot then being thrown overboard into the water, and immediately sinking, the rope is slackened until about 70 or 80 fathoms have run out, after which the rope is fastened to the stern of the boat, which is by it restrained, and rides as it were at anchor. The velocity of the current is then easily tried by means of the log and half-minute glass, in the same manner as the ship's rate of sailing is usually ascertained. It is evident, however, that this method is grounded upon the supposition that the current does not reach so low below the surface of the sea as the place to which the iron pot has been sunk; which, though perhaps mostly true, cannot be always so. Therefore, when the iron pot is not out of the influence of the current, or when it happens to come within an under-current, the result of the above-described method must unavoidably prove fallacious: nor does the present knowledge of navigation afford any other safer method for the purpose.

When the direction and velocity of a current has been ascertained, the application of it to the purposes of navigation is easy and evident: for if the ship sails along the direction of the current, its progress is the sum of the current's velocity and the rate given by the log; if the ship sails directly against the current, then its real progress is the difference of the two above-mentioned particulars, and is directed the same way with the strongest: hence it may happen that a vessel, which appears to proceed in full sail towards the north, may actually go backwards towards the south, in consequence of a strong current. If the current runs assant to the direction of the ship, then, since the ship is impelled by two forces, *viz.* by the force of the wind in one direction and by the current in another direction, its real course must be in the diagonal of a parallelogram, of which the sides are the velocity of the current and the velocity with which the wind impels the ship. See Varenus' Geography, Naval Gazetteer, &c.

CURRENT Island, in Geography, a small island in the

Pacific ocean, discovered by captain Carteret, in October, 1767, and so called on account of the strong southerly current which set the ship, in this part of the ocean, from 24 to 30 miles southward every day, besides the difference it might make in its longitude. N. lat. $4^{\circ} 40'$. E. long. $134^{\circ} 3'$. Near this island are two other small islands, which captain Carteret called St. Andrew's islands, in N. lat. $5^{\circ} 18'$. E. long. $133^{\circ} 40'$.

CURRENT Sailing, is the method of resolving those problems in navigation, in which the effect of a current is taken into consideration.

That point of the compass to which a current runs, is called its *setting*, and the rate of its motion *per* hour is called its *drift*.

In a calm, it is evident, a ship will be carried in the direction, and with the velocity, of the current.

Hence, if a ship sails in the direction of the current, her rate will be augmented by the velocity of the current; but if sailing directly against it, the distance made good will be equal to the difference between the rate of the ship as given by the log, and that of the current; and the absolute motion of the ship will be a-head, of her rate exceeds that of the current; but, if less, the ship will make sternway. If the ship's course be oblique to the direction of the current, her true course and distance will be compounded of the course and distance given by the log, and of the setting and drift of current; and the distance made good in a given time, will be represented by the third side of a triangle, of which the distance given by the log and drift of the current in the same time, are the other two sides. The two first cases are evident, and the last may be illustrated as follows.

In the parallelogram ABCD, (*Plate I. Navigation. fig. 3.*) let AB be the distance run by the ship, in the same time that a current sets from B to C, and AM a meridian; then AC being joined, will be the distance made good; the angle MAB the course *per* compass, and MAC the true course, or that resulting from the combined motions of the ship and current. For since the current neither assists nor prevents the ship from approaching the line BC, the wind will bring it there, in the same time as if no current existed; and as the wind has no tendency on the current, and the direction of the ship being in the line AB, the current will bring the ship to the line CD, in the same time as if in a calm; therefore, the ship will be found to be at C, the point of intersection of the lines BC, CD; and, consequently to have sailed in the direction AC, the diagonal of the parallelogram contained between the distance run, and the drift of the current in the same time.

The setting and drift of the principal currents, are in general known nearly, but with respect to unknown or doubtful currents, the following method is usually employed to ascertain their setting and drift.

In the open ocean, in calm weather, the setting and drift of a current are easily found by taking a boat to some little distance from the ship, which being brought up, by sinking from the stern a heavy iron pot or loaded kettle, to the depth of about 100 fathoms; then, the log being hove, its bearing will be the setting of the current, and the number of knots run out in half a minute will be its drift. See CURRENT.

When in sight of land, the setting and drift of a current may be found by observing some remarkable place, or places on shore, at certain intervals of time.

Examples.

I. A ship sailed S. by W. 21 hours, at the rate of 8 knots an hour, in a current that set E.N.E. 3 miles an hour, required the course and distance made good in that time.

CURRENT.

By Construction.

Describe the circle N.E., S.W., (*fig. 4*) in which N.S. represents the meridian of the place sailed from, and E.W. the parallel of that place, these lines being at right angles to each other; from the centre C, draw the S. by W. line CB, equal to 168 miles ($= 1 \times 8$) the distance run in a given time; and from B, draw BD in an E.N.E. direction, which make equal to 63 miles ($= 21 \times 3$); join CD, which will be the distance made good, and will measure 143 miles, and the measure of the angle SCD being applied to the line of chords, will be found to be S. $10^{\circ} 15'$ E.

By Calculation.

In the triangle CBD, are given the sides CB, BD, equal to 168 and 63 respectively, and the included angle CBD equal to five points, the supplement of the number of points contained between the E.N.E. and S. by W. rhumbs; to find the angles C and D, and the side CD.

To find the angles.

Distance	BC = 168	
Distance	BD = 63	
Sum	231	
Difference,	105	
Angle CBD =	5 points,	
Sum of C and D =	11 points,	
Half	$5\frac{1}{2}$ points =	$61^{\circ} 52'$
As the sum of the sides	231	2.36361
Is to the diff. of the sides	105	2.02119
So is the tang. of half sum angles	$61^{\circ} 52'$	10.27189
To tangent of half diff. angles.	$40^{\circ} 22'$	9.92947
Angle D	- - - $102^{\circ} 14'$	
Angle BCD	- - - $21^{\circ} 30'$	
Angle BCS	- - - S. $11^{\circ} 15'$ W.	
True course SCD	- - - S. $10^{\circ} 15'$ E.	

To find the distance CD.

As the sine of BDC	- - $102^{\circ} 14'$	9.99002
Is to the sine of CBD,	- - $56^{\circ} 15'$	9.91985
So is BC	- - 168	2.22531
To the distance CD	- - 142.9	2.15514

Remark.

The most expeditious method of performing questions of this kind, is by inspection; by this method of operation, the preceding example is resolved as follows.

Courses.	Dist.	Diff. Lat.		Departure.	
		N.	S.	E.	W.
S by W. E N.E.	168		164.8		32.8
	63	24.1		58.2	
		24.1	164.8	58.2	32.8
			24.1	32.8	
S. 10° E.	143		140.7	25.4	

II. A ship from a certain headland in the latitude of $34^{\circ} 00'$ N., sails S.E. by S. 12 miles in three hours, in a current that sets between N. and E., and then the same headland is found to bear W.N.W., and the ship to be in the latitude of $33^{\circ} 52'$ N., required the setting and drift of the current?

By Construction.

Having drawn the compass N.E.S.W., (*fig. 5*) let A represent the place of the ship, and draw the S.E. by S. line AB equal to 12 miles, also the E.S.E. line AC.

Set off from A upon the meridian AD, equal to 8 miles, the difference of latitude, and through D draw DC parallel to the E. and W. line W.E., meeting AC in C. Join C and B with the right line BC; then C will be the ship's place, the angle ABC the setting of the current from the S.E. by S. line, and the line BC will be the drift of the current in three hours.

By Calculation.

In the triangle ADC, right-angled at D, are given the difference of latitude AD, equal to eight miles, the angle DAC equal to $67^{\circ} 30'$. Whence for AC the distance the ship has sailed, it will be:

As radius	- - -	10.00000
Is to the secant of the course DAC	$67^{\circ} 30'$	10.41716
So is the difference of latitude	8	0.90309
To the distance	20.9	1.32025

Again, in the triangle ABC, are given AB, equal to 12 miles, AC equal to 20.9, and the angle BAC equal to $33^{\circ} 45'$, the distance between the S.E. by S. and E.S.E. lines: Whence for the angle at B, it will be,

As the sum of the sides AD and AB	32.9	1.51720
Is to their difference	- - 8.9	0.94939
So is the tangent of half the sum of the angles B and C	- - } $73^{\circ} 7'$	10.51806

To the tangent of half their diff. $41^{\circ} 43\frac{1}{2}'$ 9.95025

Consequently, the angle B is $114^{\circ} 51'$, and, therefore, the setting of the current will be N. $81^{\circ} 6'$ E. or E. by N. $2^{\circ} 21'$ E. Then for BC, the current's drift in three hours, it will be,

As the sine of B	- - - $114^{\circ} 51'$	9.95780
Is to the sine of A	- - - $33^{\circ} 45'$	9.74474
So is the distance run AC	20.9	1.32025

To BC 12.8 1.10719
the current's drift in three hours, and consequently the current sets E. by N. $2^{\circ} 21'$ E. 4.266 miles an hour.

III. A ship at sea in the night has sight of Scilly light, bearing N.E. by N. distant four leagues, it being then flood tide, setting E.N.E. 2 miles an hour, and the ship running at the rate of five knots an hour; what course and distance must the ship fail to make the Lizard, which bears from Scilly E. $\frac{1}{2}$ S. distance 17 leagues?

By Construction.

Draw the N.E. by N. line AS = 12 miles, (*fig. 6*); hence S will represent Scilly. From S draw SL = 51 miles, and parallel to the E. $\frac{1}{2}$ S rhumb; then L will represent the Lizard; draw LC parallel to the E.N.E. rhumb, and equal to two miles, and make CD equal to five miles; or, because these numbers are too small to determine the triangle with precision, let equimultiples of them be taken, as 10 and 25. From A draw AB parallel to CD, meeting LC,

J. C produced in B, then AB will be the distance, and the angle S A B the course; the first of these applied to the scale will measure nearly 45 miles, and the course will be about S. 88° E.

By Calculation.

In the triangle S A L, are given the sides A S, S L, equal to 12 and 51 respectively, and the angle A S L equal to 10½ points, to find the other angles and distance A L.

To find the Angles.

Distance	S L = 51	
	A S = 12	
Sum	- - -	63
Difference	- - -	39
Angle	- A S L	10½ points.
Sum of	S A L, S L A	5½
Half sum	2¾ = 3	56'
As the sum of the sides	- - -	63° - 1.79934
Is to the difference of the sides	- - -	39° - 1.59105
So is the tangent of half sum of the angles	- - -	30° 56' 9.77763
To the tangent of half diff. angles	- - -	20° 21' 9.56735
Angle S A L	- - -	51° 17'
N A S = 3 points	- - -	33° 45'
N A L	- - -	85° 2'
L A E = F L A	- - -	4° 58'
T L B = 2 points	- - -	22° 30'
A L B = D L C	- - -	17° 32'

To find the distance A L.

As the sine of S A L	- - -	51° 17'	9.89223
Is to the sine of A S L	- - -	10½ points.	9.94543
So is the distance S L	- - -	51	1.70757

To the distance A L	- - -	57.65	1.76077
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In the triangle D L C, are given D C = 5 miles, the hourly rate of sailing, L C = 2 miles, the drift of the current in the same time, and the angle D L C = 17° 32', to find the angle L D C = L A B.

As distance D C	- - -	5	0.69897
Is to the distance L C	- - -	2	0.30103
So is the sine of L D C	- - -	17° 32'	9.47894

To the sine of L D C	- - -	6° 55'	9.08100
Angle N A L	- - -	85° 2'	°

N A B	- - -	91° 57'
Course	- - -	S. 88° 3' E.

Lastly, in the triangle A B L, the side A L, together with the angles are given, to find the distance A B.

As the sine of A B L	- - -	155° 33'	9.61689
Is to the sine of A L B	- - -	17° 32'	9.47894
So is the distance A L	- - -	57.65	1.76077

To the distance A B	- - -	41.96	1.62282
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For more examples on this subject the reader is referred to Dr. Mackay's "Treatise on Navigation."

CURRER, in *Geography*, a town of Hindoostan, in the country of Viliapour; 60 miles W. of Vissapour.

CURRESO, in *Ornithology*, a name given by Dauphin to the CRAX *lector*, which see.

CURRICULUS, in our *Ancient Writers*, denotes the year, or course of a year.

"Actum est hoc annorum Dominicæ incarnationis quater quinquagenis & quinquies, quinis latus, & tribus *curriculis*;" i. e. in the year 1028; for four times fifty makes two hundred, and five times two hundred makes one thousand; five lustres are twenty-five years, and three *curriculi* are three years.

CURRIED HIDE. See HIDE.

CURRIERS are those who dress and colour leather, after it comes from the tan-yard. No currier shall use the trade of a butcher, tanner, &c. or shall carry skins insufficiently tanned, or gash any hides of leather, on pain of forfeiting for every hide or skin 6s. 8d. Curriers not carrying the leather sufficiently shall forfeit the ware or the value, &c. Stat. 1 Jac. I. c. 22. If curriers do not carry leather that is sent to them, within six teen days between Michaelmas and Lady-day, and in eight days at other times, they are liable to a forfeiture of 5l. on conviction before a justice, to be levied by distress, &c. but subject to a mitigation. 12 Geo. II. c. 25. Curriers and such as deal in leather, may cut and sell it in small pieces in their shops, to any persons whatsoever. Stat. Id.

CURRIER'S *Shaves*, or *paring knives*, in *Heraldry*, instruments used by the curriers, and borne in the arms and crest of their company.

CURRITUCK, in *Geography*, a county of America, situated on the sea-coast of Edenton district, N. Carolina, and forming the N.E. corner of the state. bounded E. by Currituck sound, N. by Virginia, S. by Albemarle Sound, and W. by Camden county, containing 6928 inhabitants of whom 1530 are slaves. *Dismal* swamp lies in this county, on the S. side of Albemarle Sound, and is now supposed to contain one of the most valuable rice estates in America. In the midst of this Dismal, which contains upwards of 350,000 acres, is a lake about 11 miles long, and 7 miles broad. A navigable canal, 20 feet wide, and 5½ miles long, connects the waters of the lake with the head of Skappernong river. Several saw-mills are erected about 500 yards from the lake; and as the water of the lake is higher than the banks of the canal, the company can at any time lay under water about 10,000 acres of rich swamp, which is admirably fitted for the culture of rice. See GREAT DISMAL.

CURRITUCK, or CARATUUK, a settlement in Maine, 28 miles above Norridge-walk. In 1792 this was the uppermost settlement on Kennebach river, and then consisted of about 20 families, and in 1800 of 136 inhabitants. Morse.

CURRODREPANUS, formed of *currus*, chariot, and *ῥεπανον*, scythe, or sickle; in *Antiquity*, a kind of chariot armed with scythes. The driver of these chariots was obliged to ride on one of the horses, as there was no other seat for him; the usual place for him being all armed with knives, as was likewise the hinder part of the chariot. There were no scythes pointing down to the earth, either from the beam or axle-tree; but these were fixed at the head of the axle-tree in such a manner as to be moveable by means of a rope, and thereby could be raised or let down, and drawn forward or let fall backward, by relaxing the rope.

CURRUCIA, in *Ornithology*, a name given by Frisch. Av. t. 24. to a variety of the MUSCICAPA *Atricapilla* of Cme in: which see;—and also to varieties of the MOTACILLA *Atricapilla* of Gmelin; and also to the MUSCICAPA *grifola* of Gmelin, which see respectively.

CURRUCIO, Gainer's name of the *MUSCICAPA* *9-1* *fol.*

CURRUS TRIUMPHALIS, triumphal chariot. See **TRIUMPH**.

CURRY-COMB, in *Rural Economy*, is an implement of the comb kind, thickly set with small teeth, which is used in the operation of currying animals.

CURRYING, the operation of combing and dressing any sort of domestic animal by means of a curry-comb, in order that the dust may be removed from their coats, and they may have a sleek appearance.

CURRYING is the art of dressing cow-hides, calves-skins, seal-skins, &c. principally for shoes; and this is done either upon the flesh or the grain.

In dressing leather for shoes on the flesh, the first operation is soaking the leather in water, until it be thoroughly wet; then the flesh-side is shaved on a beam, about seven or eight inches broad, with a knife of a peculiar construction, to a proper substance, according to the custom of the country, and the uses to which it is to be applied. This is one of the most curious and laborious operations in the whole razzery of currying. The knife used for this purpose is of a rectangular form, with two handles, one at each end, and a double edge. They are manufactured at Cirencester, and composed of iron and steel; the edge is given to them by rubbing them on a flat stone of a sharp gritty substance, till it comes to a kind of wire; this wire is taken off by a fine stone; and the edge is then turned to a kind of groove wire by a piece of steel, in form of a bodkin, which steel is used to renew the edge in the operation.

After the leather is properly shaved, it is thrown into the water again, and scoured upon a board or stone commonly appropriated to that use. Scouring is performed by rubbing the grain or hair-side with a piece of pumice-stone, or with some other stone of a good grit, not unlike in thickness and shape to the slate with which some houses are covered. These stones force out of the leather a white sort of substance called the bloom, produced by the oak-bark in tanning. The hide or skin is then conveyed to the shade or drying-place where the oily substances are applied, termed stuffing or dubbing; the oil used for this purpose is prepared by the oil leather-dressers, by boiling sheep-skins or doe-skins in cod-oil. This is put on both sides of the leather, but in a greater and thicker quantity on the flesh than on the grain or hair-side.

Thus we have pursued the currying of leather in its wet state, and through its first stage, commonly called getting out.

When it is thoroughly dry, an instrument with teeth on the under-side, called a graining board, is first applied to the flesh side, which is termed graining; then to the grain-side, called bruising; the whole of this operation is intended to soften the piece of leather to which it is applied. Whitening or pring succeeds, which is performed with a fine edge of the knife already described, and used in taking off the grease from the flesh. It is then boarded up or grained again, by applying the graining board, first to the grain and then to the flesh.

It is now fit for waxing, which begins with colouring. This is performed by rubbing with a brush dipped in a composition of oil and lamp-black on the flesh, till it be thoroughly black; it is then sized, called black sizing, with a brush or sponge, dried, tallowed with a woollen cloth; and sleeked upon the flesh with a broad smooth piece of glass, sized again with a sponge; and when dry this sort of leather, called waxed or black on the flesh, is curried.

Currying leather on the hair or grain-side, termed black

on the grain, is the same in the first operation with that dressed on the flesh, till it is scoured. Then the first black is applied to it, while wet; which black is a solution of copperas in fair water, or in the water in which the skins, as they come from the tanner, have been soaked; this is first put upon the grain, after it has been rubbed with a stone; then rubbed over with a brush dipped in stale urine; sleeked out with an iron slicker, in order to make the grain come out as fine as possible; and then stuffed, in the manner already described among the first operations of currying; and when dry it is seasoned, *i. e.* rubbed over with a brush dipped in copperas water on the grain, till it be perfectly black; then sleeked with a stone of a good grit, to take out the wrinkles and coarse grain as much as possible: after this the grain is raised with a fine graining board, by turning the skin or piece of leather in various directions; and when a little dried, it is bruised in order to soften it. When it is thoroughly dry it is whitened, bruised again, and grained in two or three different ways; and when oiled upon the grain with a mixture of oil and tallow, it is finished.

Bull and cow-hides are sometimes curried for the use of saddlers and collar-makers; but the principal operations are much the same as those we have already described. It should, however, be observed, that only a small portion of flesh is taken from hides designed for these purposes. Hides for the roofs of coaches, &c. are shaved nearly as thin as shoe-hides, and blacked on the grain.

CURSED. See **ACCURSED**, and **CORSEID**.

CURSHUND, in *Zoology*, the name given by Ridia-ger to the greyhound, *Canis Curforius*. See **GREYHOUND**.

CURSING. See **SWEARING**.

CURSITORS, officers or clerks belonging to the court of chancery, who make out original writs.

These are also called *clerks of the court*, (*clerici de curfu*, 18 Ed. III. stat. 5.) and are twenty-four in number; making a coporation of themselves. To each of them are allotted several shires; in which shires they exercise their functions (2 Inst. 670.) This coporation consists of a principal, two assistants, 21 cursitors, and a bag bearer.

CURSITOR-Baron, an officer in the court of Exchequer, who administers the oath of all high-sheriffs, under-sheriffs, bailiffs, auditors, receivers, collectors, controllers, surveyors, and searchers of all the customs in England.

CURSOLI. See **CURZOLA**.

CURSOR, a little ruler, or label of brass, divided like a line of lines, and sliding in a groove, or notch, along the middle of another label, or ruler, representing the horizon, and always at right angles to it. It is used in the analemma.

CURSOR is also used for a point screwed on the *beam compass*; and which may be moved, or slidden along the beam thereof for the striking of greater or less circles.

CURSULA, in *Ancient Geography*, a town of Italy, in Latium, situated 80 stadia from Rieti, near mount Coreto, called *Corfula* by Tacitus; and supposed to be the present town of Cassia, in Umbria.

CURSUS, a town of Spain, in Bætica, placed by Ptolemy in the country of the Turdetani.

CURSUS Achilles, a point of land lying to the left of the Borysthenes, at its mouth. *Achilles* is said by Mela to have celebrated games in this place, when he was entering into the Pontic sea.

CURTA, a town of Lower Pannonia, situated on the banks of the Danube; marked in the Itinerary of Antonine

nine between Arrabonæ and Alicanum; supposed to be *Buda*.

CURTAILING, in the *Manege*, the docking, or cutting off a horse's tail.

The practice of curtailing is no where in vogue so much as in England; it being a popular opinion, that the cutting off the tail renders the horse's chine or back the stronger, and more able to bear burdens.

The amputation is usually made between the fourth and fifth joints of the tail; a ligature being first tied tight about the place, to prevent the flux of blood; and the raw stump afterwards seared up with a hot iron, till the extremities of the vessels be all stopped.

This absurd and barbarous custom is now in great measure out of fashion; and horses are allowed to enjoy the use, and retain the beauty of their tails, as given to them by nature.

CURTAIN, in *Fortification*. See **CURTIN**.

CURTAINS, in a *Fire-ship*, are pieces of a coarse canvas, about three quarters of a yard wide, and a yard long, thickened in a melted composition of pitch, sulphur, rosin, tallow, and tar, and covered with saw-dust on both sides.

CURTATE DISTANCE, in *Astronomy*, the distance of a planet's place from the sun or earth, reduced to the ecliptic; or, the interval between the sun or earth, and that point where a perpendicular, let fall from the planet, meets with the ecliptic.

CURTATION, in *Astronomy*, the interval between a planet's distance from the sun, and the curtate distance.

From the preceding article it is easy to find the curtate distance; whence the manner of constructing tables of curtation is obvious.

The quantity of inclination, reduction, and curtation of a planet, depending on the argument of the latitude; Kepler, in his Rudolphin Tables, reduces the tables of them all into one, under the title of *Tabulæ Latitudinariæ*.

CURTESY of England, *jus curialitatis Angliæ, Tenant by*. See **COURTESY** and **TENANT**.

CURTEUS FALCATUS, Lat.; a chariot armed with scythes. The ancients made use of them in war; and the invention of them, according to Diodorus, goes back to the highest antiquity. Ninus used them against the Bactrians; and the nations that opposed the Israelites also fought in them.

CURTEYN, CURTANA, a name given to king Edward the Confessor's sword, which is the first sword that is carried before the kings of England at their coronation.

It is said, the point of it is broken, as an emblem of mercy.

CURTI, GIROLAMO, in *Biography*, a Bolognese painter, called Il Dentone, from the circumstance of his carrying his mouth half-open, so as to discover two large front teeth. He was born in the 16th century of very poor parents, who had him taught the business of a thread-spinner. At the age of 25, however, he began to practise design in company with Lionello Spada; but finding the study of the human figure too arduous an undertaking, he determined to confine his exertions to the attainment of perspective, and the practice of that species of decorative painting which the Italians term *quadratura*. He accordingly received some instructions in this way from Baglione, and grounded himself in architecture by studying Vignola and the finest remains of the ancients at Rome. Curti soon acquired the reputation of being one of the best artists in his line, and was eagerly employed in many great works in Rome, Bologna, Parma, and other parts of Italy,

and in particular in the first-mentioned city, where he painted a hall in the palace of prince Lodovisi, which was extremely admired, and judged far to surpass the hitherto unrivalled works of Gio. Alberti in the Sala Clementina in the Vatican. He died at Parma in 1631. Lanzi. Stor. Pitt.

CURTI, FRANCESCO, an engraver, born in Bologna, who flourished in the 17th century. His style seems formed on that of Cherubino Alberti, though the execution is less masterly, and the extremities of the figures drawn with less correctness. He engraved after Guercino, Parmigiano, Guido, and other celebrated masters. The following are amongst the best of his works.

"The Virgin teaching the Child Jesus to read; from Guercino. A drawing-book from the designs of the same artist. A set of 16 portraits, 1633. Two heads of the Virgin and St. Catherine, upon the same plate." Heineken. Strutt.

CURTI, BERNARDINO, probably a relation of the preceding, and also an engraver. This artist executed a great number of portraits, besides other works, which, however, are not much esteemed. We shall only notice the following:

"An emblematical subject from Luc. Ferrar, a middling sized plate, lengthways. The Virgin, a half figure, with the Infant Jesus and the Child St. John, 1640." Heineken. Strutt.

CURTICONE, in *Geometry*, a cone whose top is cut off by a plane parallel to its basis; called also *truncated cone*.

CURTILAGE, CURTILAGIUM, in *Law*, a yard, backside, or piece of ground, lying near a dwelling-house.

CURTILES TERRÆ. See **COURT-lands**.

CURTILLA, in *Ornithology*, a name given by some to the *CORVUS sylvaticus* of Gesner, which see.

CURTIN, CURTAIN, or COURTINE, in *Fortification*, is the part of a work which joins the flank of one bastion or demi-bastion to that of the bastion or demi-bastion next to it, whether it be in the body of the place, or in a crown-work, horn-work, &c. The curtains, with the flanks and faces of the bastions, form the *encinte* of the body of a place.

Do-Cange derives the word from the Latin *cortina, quasi minor cortis*, a little county-court, inclosed with walls: he says, it was in imitation hereof, that they gave this name to the walls and parapets of cities, which inclose them like courts: he adds, that the *curtains* of beds take their name from the same origin; that *cortis* was the name of the general's, or prince's tent; and that those who guarded it were called *cortinari* and *curtisani*.

The *curtin* is usually bordered with a parapet five feet high; behind which the soldiers stand to fire upon the covert-way, and into the moat.

Besiegers seldom carry on their attacks against the *curtin*, because it is the best flanked of any part.

CURTIN, angle and complement of the. See **ANGLE** and **COMPLEMENT**; see also **MILITARY CONSTRUCTION**.

CURTIS, WILLIAM, in *Biography*, an eminent botanist and entomologist, was born at Alton in Hampshire, in 1746. His family were quakers, and his father a tanner; but he was at the age of fourteen bound apprentice to his grandfather, an apothecary in his native town. It happened that the ostler of an adjoining inn was a practical botanist, versed in the study of Gerard and Parkinson's herbals. Such an intimacy for their son's sober parents might have deprecated, and ambitious ones have contemned; yet hence the youthful Curtis imbibed that taste for natural knowledge

know which proved the source of his future fame and merit, and above all, of which is not always justly appreciated, his happiness. Some more systematic works falling in his way soon after, infused into his apt and ardent mind principles or method, and of Linnæan philosophy, which neither his original preceptor, nor the books he studied, could ever have taught. At the age of twenty Mr. Curtis came to London, in order to finish his medical education, and to seek an establishment in the line to which he was destined. He was associated with a Mr. Talwin of Gracechurch street, to whose business he at length succeeded; but not without having from time to time received many reproofs and warnings, respecting the interference of his botanical pursuits with the more obviously advantageous ones of his profession. Nor were these warnings without cause. The street-walking duties of a city practitioner but ill accorded with the wild excursions of a naturalist; the apothecary was soon swal-owed up in the botanist, and the shop exchanged for a garden. Mr. Curtis therefore became a lecturer on the principles of natural science, and a demonstrator of practical botany. His pupils frequented his garden, studied in his library, and followed him into the fields in his herborizing excursions. His first garden was situated at Bernoldsey; afterwards he occupied a more extensive one at Lambeth Marsh, which he finally exchanged for a more salubrious and commodious spot at Brompton. This last garden he continued to cultivate till his death.

Mr. Curtis was very early led to combine the study of insects and their metamorphoses with that of plants, and his various gardens were furnished with accommodations for this pursuit. Hence he became an author; his first publication being a pamphlet entitled, "Instructions for collecting and preserving Insects; particularly Moths and Butterflies, illustrated with a copper plate," and printed in 1771. In the following year he published a translation of the *Fundamenta Entomologie* of Linnæus, entitled, "An Introduction to the Knowledge of Insects," many valuable additions being subjoined to the original treatise. These two pamphlets have contributed more than any similar works to diffuse a knowledge of scientific entomology in England, and to engraft on the illiterate illiberal stock of mere collectors, a race of enlightened and communicative observers of nature: who no longer hoard up unique specimens, and selfish acquisitions, but contribute their discoveries and their experience for the benefit of the agriculturist, the manufacturer, or the physician.

The celebrity which these publications procured for their author was soon altogether eclipsed by what arose from his botanical labours, which have placed him in the very first rank of English writers in that department of science. In 1777 appeared the first number of his *Flora Londinensis*, containing 6 folio plates, with a page or more of letter press consisting of a description in Latin and English, with synonyms, of each plant, and copious remarks on its history, uses, qualities, and the insects it nourishes. Each number was sold at half a crown plain, 5 shillings coloured, and some copies, finished with extraordinary care, were sold at seven shillings and six pence. The first artist employed in making the drawings for this work was Mr. Kilburn, who used a *camera obscura* for the purpose; his sketches were shaded with Indian ink, before the colours were laid on. The performances of this artist have not been excelled in any similar work. When from other engagements Mr. Kilburn was obliged to relinquish his task, Mr. Sowerby was employed, and maintained undiminished the perfection of the figures. After him Mr. Sydenham Edwards has

been engaged by Mr. Curtis, with no less credit, both in the publication of the *Botanical Magazine*; hereafter mentioned. Of the plates of the *Flora Londinensis* too much cannot be said; their beauty and botanical accuracy are alike eminent, and it is only to be regretted that the manufactory of paper, as well as the typographical art, were in so degraded a state when this book first appeared. For this its author cannot be responsible, nor are these defects of any moment in the eyes of learned or scientific readers. To them the *Flora Londinensis* is a mine of original, solid, practical information, conveyed in a style of candour and unalloyed love of science, by which the author, as well as his subject, steal the hearts of his readers. It has already been observed, (*Transactions of the Linnæan Society*, v. iv. p. 280.), that the work in question, "independent of its excellent figures, ranks next to Ray's *Synopsis*, in original merit and authority upon English plants." It may be added that the works of Curtis have tended, more than any other publications of their day, to give that tone of urbanity and liberality to the science, which every subsequent writer, of good character, has observed. Wherever their author swerved in any degree from this candour, which was very seldom, and not always without provocation, it was always to his own loss, and he was thus led into some of the very few mistakes that he has committed; but these we shall consign to oblivion. His mention of Mr. Hudson's "usual inaccuracy" is most reprehensible. The author of the *Flora Anglica* was indeed blameable for treating the infant publication of Curtis with lofty neglect, but it is not true that he was "usually inaccurate" in his own labours. Mr. Curtis conducted himself rather more uncandidly towards the work entitled *English Botany*, because he conceived it an encroachment on his own botanical domain, of which a narrative is given in the preface to its seventh volume, unnecessary to be repeated here. His fame and his work were superior to all rivals, and the object of his unjust displeasure is proud to bear testimony to his merit, with which no person was better acquainted. The *Flora Londinensis* was extended to six fasciculi, of 72 plates each. It is to be regretted that the feelings above alluded to occasioned its author in the latter part to describe, from garden specimens, several plants out of his originally intended limits, respecting which he could give no particular information; while numerous species growing near London remained unexplained and ill-understood. A botanist who had like him so admirably illustrated the genera *Polygonum*, *Rumex*, *Chenopodium*, and several others, makes us regret that his genius was ever diverted from its original bent. On another occasion however we rejoice that it was otherwise employed. Ten years after the beginning of his *Flora*, Mr. Curtis undertook a new publication, the *Botanical Magazine*, a work whose sale has been extensive beyond all former example, and which is in every respect worthy of its author. No book has more diffused a taste for unostentatious nature and science. It rewarded its contriver with pecuniary emolument as well as with merited celebrity, and is still continued with unabated utility. It is designed to be a general repository of garden plants, whether previously figured or not in other works, but it has often had the advantage of giving entire novelties to the public.

In the year 1782, Mr. Curtis published a history of the brown-tailed moth, an insect confounded by Linnæus under his *Phalena Cbrysoforrhoea*. The design of this pamphlet was to allay the alarm which had been excited in the country round the metropolis, by an extraordinary abundance of the caterpillars of this moth, and which was so great, that the parish officers offered rewards for collecting these caterpillars,

pillars, and attended in form to see them burnt by bushels at a time. It was one of those popular alarms which every now and then arise among the ignorant multitude, and which vanish before the first ray of common sense. When the natural history of the insect was inquired into, and compared with that of others, no cause for any great apprehension could be discerned; and, indeed, the subsequent years were not more abundant in this species than usual.

Besides the above works, Mr. Curtis published "Practical Observations on the British Grapes," in 8vo.; his truly praise-worthy aim being to direct the farmer to a knowledge and discrimination of the species and their qualities. He also, from time to time, printed catalogues of his garden. He was induced, by the unfortunate alarm which he conceived at the publication of "English Botany" above-mentioned, to put forth diminished figures in octavo of his great *Flora*; but these met with no approbation nor success, and were soon discontinued. His "Lectures on Botany," rendered needlessly expensive by superfluous coloured plates, have appeared since his death; but for this publication he is not responsible. Two admirable entomological papers of Mr. Curtis are found in the "Transactions of the Linnæan Society; of which society he was one of the original fellows. The first of these is an account of the *Silpha Grisea* and *Curculio Lapathi*, two coleopterous insects very destructive to willows. The other paper is intended to shew that the *Aphides*, or lice of plants, are "the sole cause of the honey-dew;" a new theory on the subject, and perfectly just, as far as concerns the most common kind of honey-dew. This paper was digested by the president from the unfinished materials of its author, and communicated to the society after his death, which happened on the 7th of July, 1799, after he had for near a twelvemonth laboured under a disease in the chest, supposed to be of a dropsical nature; but which was rather, perhaps, an organic affection of the heart, or of the great vessels immediately connected with it. His remains were interred at Battersea church. He left behind him the character of an honest friendly man, a lively and entertaining companion, and a good master. He was ever ready to encourage and assist beginners in his favourite science, and always endeavoured to render that science as attractive as possible. It must not be forgotten that he was one of the first who, in spite of authority, contributed to remove some reproaches to which it was justly liable on the score of indelicacy. His example has been followed by other writers (see CLITORIA); and its salutary effects have only in one disgraceful instance, which we shall not drag forth from its merited obscurity, been attempted to be counteracted. This last praise is justly paid to Mr. Curtis by an excellent and very eminent friend, who has given the world a history of his life and merits in the Gentleman's Magazine for 1799, whence we have derived many of the above particulars. S.

CURTISIA, in *Botany*, (named in honour of William Curtis, author of *Flora Londinensis*, &c.) Hort. Kew. 3. 507. Schreb. 1729. Lam. Ill. 186. Willd. 247. Class and order, *tetrandria monogynia*.

Gen. Ch. *Cal.* Perianth one-leaved, four-parted; segments egg-shaped, acute. *Cor.* Petals four, egg-shaped, obtuse, sessile, longer than the calyx. *Stam.* Filaments four, inserted into the receptacle, awl-shaped, shorter than the petals; anthers egg-shaped. *Pist.* Germ' superior, egg-shaped; style awl-shaped, the length of the stamens; stigma four or five-celled. *Peric.* Drupe somewhat globular, succulent, smooth. *Seed.* Nut roundish, boney, four or five-celled; kernels solitary, oblong.

Ess. Ch. Calyx four-parted. Petals four. Drupe superior, roundish, succulent; nut four or five-celled.

Sp. C. *faginea*. Thunb. Prod. 28. Lam. Ill. Pl. 71. (*Relbania faginea*; Gmel. Syst. Veg. 247. *Junghansia faginea*; Gmel. Syst. Veg. 259. *Sideroxylon foliis acuminatis dentatis, fructu monopyrens flavo*; Burm. Afr. 235. tab. 82.) One of the largest trees in the African woods. Younger branches pubescent. *Leaves* opposite, on short petioles, ovate-lanceolate, sharply toothed, entire at the base, smooth above, pubescent underneath. *Flowers* very small, in a terminal panicle. The Hottentots and Caffres make the shafts of their javelins or assaguays from its wood. It is called in Dutch wite-esse, stink-hout, and assaguay-hout, or assaguay-tree.

CURTIVS, M., in *Biography*, a Roman whose patriotism has been celebrated by Livy; and though the fact, which is recorded in connection with his name, and by which he is rendered illustrious, has been the subject of much discussion and doubt, yet there was unquestionably some foundation for the story, which is thus recorded by the historian. "In the year 392 of the city, the ground in the midst of the forum, either from an earthquake, or some similar cause, opened and left a vast chasm, which could not be filled by any human art. The oracle was consulted, who declared that the Roman state would endure for ever, provided they threw that into the gulf in which the Romans were most powerful. Curtius heard the answer, and asked if his countrymen possessed any thing so valuable as their arms and courage? The courage of the hero was well known; his question caused the most profound silence: Curtius turned his eyes towards the Capitol, and the temples of the gods overlooking the forum, and stretching his hands first towards heaven, and next towards the bottom of the gulf, solemnly devoted himself. He then, fully armed, mounted his horse decorated in all his caparisons, and plunged into the chasm; the applauding people of both sexes throwing after him flowers and fruit." This was afterwards called the Curtian lake, in memory of the deed. Livy, tom. ii. p. 67, 68. Mattaire's edit.

CURTIVS, QUINTUS RUFUS, a Roman historian, who is known now only for his history of the reign of Alexander the Great, is supposed to have flourished in the reign of Vespasian or Trajan; but many doubts have been entertained on the subject. No notice is taken of his work till the twelfth century, though it is thought that Suetonius refers to the author as one among the eminent rhetoricians of those times. This history was divided into ten books, of which the first two, the end of the fifth, and the commencement of the sixth are lost: it has ever been esteemed for the elegance, purity, and floridness of its style. It is, however, vastly defective as a history, abounding with anachronisms, and various geographical mistakes. The Elzevir edition of this work, and also the Delphin editions of 1678 and 1724, and the Variorum of 1708, are highly regarded by critics. See Preface to the Delph. edit.

CURTIVS, MATTHEW, a native of Padua, acquired considerable reputation for his skill in medicine, which he taught in succession at Padua, at Florence, at Bologna, and at Pisa. From Pisa he was called to Rome by the pope Clement VII., and appointed his physician. From an inscription on his monument, erected to perpetuate his memory, by Cosmo de Medicis, it appears that he died in 1564, aged seventy years. His works, several of which passed through many editions, and appear to have been in great vogue, are, "De Vera sectione cum in aliis affectibus, tum vel maxime in Plenitudine," Lugd. 1532, 8vo. "In Mundini Anatomien explicatio," 1550, 8vo. "De curandis

eurandis febribus *Ars Medica*, 1561, Svo. For the remainder, see Haller *Bib. Med.* Another Italian physician of the name, probably of the family, Nicholas Curtius, taught medicine at Padua for twenty-six years. He left "*Methodus consultandi, Venetiis*," 1603, folio. "*Libellus de Medic. lenientibus, purgantibus, &c.*" and "*Consilium adversus pestem*," 1615, in 2mo. These, however, were not published until several years after his death, which took place in the year 1576. Haller *Bib. Med.*

CURTOLONE, in *Geography*, a town of Italy, in the duchy of Mantua, four miles W. of Mantua.

CURVAT, a small town of France, in the department of the Tarn, 15 miles E. of Alby.

CURVATAPINIMA, in *Ichthyology*, a name by which Marcgrave and Piso call the fish named by English writers the scad and horse-mackrel, the SCOMBER *Trachurus*, which see.

CURVATOR COCCYGIS, in *Anatomy*, a name given by Albinus to a muscle of the coccyx discovered by himself, and not described by any other author. It is an oblong, thin, and small muscle, and for the most part tendinous. It arises with a double head, one from the inner, and the other from the lower and lateral part of the *os sacrum*; and descending, terminates in three extremities. He calls it the curvator coccygis, from its office, which is the bending the coccyx; and says, that he found it in different states, in three subjects: one very perfect and entire; in a second, more imperfect and degenerating; and in the third, resembling a ligament rather than a muscle.

CURVATURE, in general, means any deviation from straight. The word is commonly used in mathematics, in philosophy, in mechanics, and other subjects. In mathematics there are several species of curvature (*viz.* of bending or flexure) either of lines or of surfaces, the nature of which is particularly examined under various articles. Thus the curvature of a circular periphery is different from that of a parabola, and different from that of a cycloid; the curvature of a globular surface is different from that of a spheroid, and so forth. And all these peculiar curvatures, together with their origin and properties, are described under the articles CIRCLE, PARABOLA, SPHERE, &c.

In philosophy there are several cases of curvature, which demand particular notice and attentive examination; but most of these cases are treated of under those articles to which they more immediately belong. Thus the curvature of the images of objects, formed by the transmission of light through lenses, or by the reflection of the same from mirrors, will be noticed under the articles LENS, OPTICS, and MIRROR. The curvature of the rays of light, occasioned by their passing by the surfaces of solids, will be found under the article INFLECTION of light, and so forth. Hence in the present article we shall only take notice of those cases of curvature, which are not so obviously sought for under other denominations; and these are the curvature of the surfaces of liquids, and the apparent curvature of the sky.

However the particles of liquids may appear to be moveable with respect to one another, it is certain that they are in a considerable degree possessed of the attraction of aggregation, *viz.* a mutual attraction of the particles; and this attraction differs in different liquids. It is owing to this attraction, that when a separate quantity of a liquid is not under the influence of other forces, it always tends to assume a globular form; which shape is the natural consequence of a mutual attraction amongst the particles of the liquid. Thus a very small drop of water dropped through the air, and especially when the air is much rarefied, assumes a form

so very nearly globular, that the eye cannot perceive its deviation from a perfect sphere. Such is likewise the case with oils, spirits, mercury, and other fluids. But in their usual states of existence, liquids are acted upon by other forces, which may either conspire with, or oppose their attraction of aggregation, according to a variety of circumstances; whence they are obliged to assume shapes different from those which they would assume in consequence of their aggregation only. The other forces are their gravitating power, or the force by which they are drawn towards the centre of the earth; the attraction of affinity, and the attraction of cohesion, *viz.* the peculiar degree of attraction which every liquid has for other bodies. Thus, if a small drop of water be placed upon a dry and clean plate of glass, it will remain nearly of a globular form; its attraction of aggregation, which draws every particle of it towards its centre, being stronger than its gravity, and likewise more powerful than its cohesion or attraction towards the glass, which it touches in a very small spot. This attraction, however, is sufficient to retain the drop of water, when the glass is turned downwards. But if the drop be spread over the surface of the glass, then the film of water will adhere to the glass with much greater force, nor will it recover its globular shape, because by spreading the drop, its particles have been brought nearer to the surface of the glass, and in contact with a far greater extent of it. They have also been removed farther from each other, which has weakened the attraction of aggregation in a very great degree. When a pretty large drop of water is placed upon the glass, the upper middle part of it will be nearly horizontal, its gravity being more powerful than its aggregation. If the water be in considerable quantity, and it be put in a cup, or glass, then the attractions of aggregation and cohesion being much weaker than the gravitation, the surface of the water will be horizontal, excepting that part of it which lies nearest to the sides of the cup, which will be attracted, and ascending a little way will draw part of the contiguous fluid above the horizontal level, in consequence of its attraction of aggregation, so as to form a concave surface to a certain extent. If, by a little care, more water be added, so that the fluid may project above the edge of the cup or glass, then the water close to the edge will assume a surface visibly convex; it being to a certain degree prevented from running over, both by the attraction of aggregation, and the attraction towards the sides of the cup or glass. The like experiments repeated with other fluids, will be attended with results of the same species, but differing in degree, according to the nature of the fluid, and its attraction towards the other substances concerned in the experiments. Thus, if a small drop of mercury be placed upon the flat surface of a piece of glass, it will assume a globular form, in consequence of its attraction of aggregation; and it will adhere to the glass, when this is turned upside down, on account of its attraction of cohesion. But it will be found impossible to spread it over the surface of the glass, like water, because its attraction of aggregation is much more powerful than its cohesion to the glass. And it is for the same reason that if a glass or china cup be partly filled with mercury, this fluid will not rise, like water, towards the sides of the cup; but it will form a convex curve of considerable extent.

The different degrees of attraction between a given fluid and other substances, is easily shewn by the effects of contact. Thus a small globule of mercury laid upon paper will adhere to glass when the latter is brought into actual contact, and is drawn by the glass from the paper; and in the same manner if a larger quantity of quicksilver be brought in contact with it, the small globule will leave the glass,

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glass, and will incorporate with the larger quantity of the same fluid metal.

The curvature of fluids round the bodies which float in them depends likewise upon the same causes, and hence that curvature is sometimes convex, and at other times concave. Its extent also varies considerably; it being influenced, besides the nature of the body and of the fluid, by heat and cold, and often by the interposition of a little unctuousity, or such minute bodies, as elude the strictest examination. It appears, therefore, from the above experiments and observations, that in a variety of cases fluids assume a curvature of surface which depends on the circumstances already enumerated; but those circumstances being very fluctuating, and often unperceived, it becomes extremely difficult, or rather impracticable, to determine in most cases the nature of the actual curvature, any more than to pronounce it in general terms either *convex* or *concave*. See *CAPILLARY Attraction*.

With respect to the curvature of the sky, an obvious phenomenon has been remarked from time immemorial, and several theories have been formed in explanation of it. The phenomenon is, that the starry heavens, or the ideal vault, upon which the stars seem to be fixed, has the appearance, not of a spherical surface, but of a flattened vault, having its upper part nearer to us, than its lower edge, *viz.* the sides which stand towards the horizon. And the same constellation appears to be much larger when it approaches the horizon, than when it stands nearly overhead. Yet when measured with a quadrant, its dimensions are the same in either situation. This is likewise the case with the sun and the moon. See *HORIZONTAL Moon*, and *Sun*.

In explanation of this phenomenon, several conjectures have been made, and most of them may be seen in Dr. Priestley's *History of Optics*. But it would be needless to place before our readers any other hypothesis, besides that which seems to be by far the most rational and satisfactory. According to this hypothesis, the phenomenon is considered as a deception of our sight, or rather of the judgment formed on the perception of our eyes. And this supposition is grounded upon the following well known facts, and obvious deductions. In judging of the distances of objects, we are assisted by four circumstances; *viz.* the adjustment of the axes of our eyes; the comparison of the situation of the object in question with others which stand at known distances; the angle under which a known object is seen; and the degree of distinctness with which the object appears to us.

In looking at an object, we naturally move our eyes so that their axes produced may meet at that object, and according as that object is removed farther and farther from us, so the angle made by the axes of the two eyes becomes smaller and smaller; hence by this motion of our eyes we are enabled to judge with sufficient accuracy of the distance of the object within certain limits. But when the object is removed a vast way from us, then the adjustment of the eyes becomes insensible, and of course the distance cannot be determined from it. Hence it is, that when we look at an object with only one eye, we form a very imperfect judgment of its distance. The effect arising from the situation amongst other known objects does not require any farther explanation. When the object is familiar to us, such as a man, a horse, &c. the angle under which we see it, is sufficient to inform us of its distance; for the farther the object is from us, the smaller must the angle be under which we see it. The last circumstance is the distinctness of the appearance; and since small objects become invisible to us be-

yond a certain distance, it follows, that by losing sight of the minutest parts of a large object, we see the latter more and more confused and indistinct, in proportion as it is removed farther and farther from us. Hence, by a natural association of ideas, when we see an object indistinctly, we are led to suppose, that its situation is far from us. The effect of all these circumstances may be observed in the practice of landscape-painting; for when the artist means to represent a man at a great distance, he paints him very small, and indistinct, placing him amongst such objects, or in such a spot, as may, from other circumstances, appear to be far distant from us. With respect to the celestial objects, it is evident, that the first three of the above-mentioned circumstances cannot be concerned; hence the distinctness or indistinctness of the object is the only one which can influence our judgment.

It is to be remarked, that since the earth is surrounded by an atmosphere which is loaded with vapours in various states of existence, the same object, at the very same distance, will appear to be farther from us when its situation is near the horizon, because in that case the visual rays pass through a great portion of the atmosphere, or partially-obstructing medium, and the object appears indistinct; than when it stands near the zenith, where it looks brighter, and more distinct, because the visual rays pass through a smaller portion of the atmosphere. And our judgment is led to make the same conclusion with respect to that part of the apparent vaulted heavens upon which we see the stars. But independent of the stars, or sun, and moon, the colour itself of the sky, being a more determined azure towards the zenith, and more diluted towards the horizon, is sufficient to impress us with the idea of the sky being more extended towards the horizon, than overhead.

CURVATURE, in *Mathematics*. A straight line drawn through any point of a curve-line in such a manner that no other straight line can be drawn through the same point, so as to pass between the first line and the curve on either side, is called a tangent of the curve-line. In like manner, of all the circles that can have a common tangent with a curve line at any proposed point, that one, which coalesces so intimately with the curve, that none of the rest can pass between it and the curve on either side, is said to have the same curvature as the curve at the proposed point: or it is called the circle of equal curvature, or the osculating circle.

Of all curves, the circle is that which is the most simple in its nature. It depends only on one arbitrary quantity: for when the radius of a circle is given, or found, the whole figure is determined. The periphery of a circle, too, being perfectly uniform, has an equable curvature throughout. For these reasons, it seems natural to compare curve-lines with the circle, next after the straight line. The tangents mark the directions of the several parts of a curve-line; the circles of equal curvature enable us to judge of the deviations from the rectilinear course.

It will readily be allowed, that the greater the radius of a circle is, the less is the curvature of its periphery. This is not an inference deduced from mathematical principles; it is a proposition, of which we have a general conception, and which seems to flow naturally from the notion we have of a curve-line. There can be no measure of curvature fit to be the basis of scientific reasoning, independent of definition. No part of the mathematics has been treated more vaguely, or has been obscured by more paradoxes, than the consideration of curvature. The exploded mysteries about the angle of contact, once so much agitated, deserve not to be drawn out of merited oblivion. The obscurities and inconsistencies that occur in such discussions, arise solely from the

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want of due care in laying down precise definitions. After having reflected on this subject, it appears most convenient to measure the degrees of the curvatures of different circles by the inverse proportions of the radii. Thus a circle, that has a radius twice as great as another, will, according to this definition, have only half the curvature. Having thus fixed what is meant by the proportions of the curvatures of different circles, we can compare the degrees of curvature of all other curves by the help of the osculating circles.

It is to be remarked, that the definition of the equicurve circle, which we have laid down, is independent of any assumed measure of curvature. It supposes that, when an indefinite number of circles have a common tangent with a curve-line, some of them coalesce with the curve more intimately than others: and that there is one which coalesces with the curve more intimately than all the rest. This is the equicurve circle: and the degree of curvature is considered to be sufficiently determined, when we have ascertained the circle which has the closest possible contact with the proposed curve. What is really useful in this inquiry depends upon the magnitude and the position of the equicurve circle, and not upon any nice and subtle disquisitions concerning the nature and the degrees of contact. There are cases of continued curvature, where a less circle approaches nearer to a curve line than a greater, without any limit; and there are other cases where a greater circle approaches nearer to a curve line than a less, without any limit: in the former instances, the curvature is said to be infinitely great; and in the latter, the curvature is said to be infinitely small. In all other cases of continued curvature, the degree of curvature is finite, and is measured by the equicurve circle.

The determination of the osculating circles of curve-lines is a subject that has been much treated of by mathematicians; and it is important on account of its usefulness in the doctrine of central forces. In order to lay before our readers a succinct view of what is most valuable in this research; we shall first treat of the osculating circles of the conic sections in a geometrical manner: and, in the second place, we shall give some account of Mr. Huyghens's Theory of Evolute and Involute Curves, with its application to the present subject.

Of the Osculating Circles of the Conic Sections.

PROP. I.

Let BD , (*Analytis*, Plate III. *fig. 1* and *2*) be ordinately applied to the axis of a parabola, or to the transverse axis of an ellipse, or hyperbola; and let BA and DA , drawn perpendicular to the lines touching the curve at B and D , meet in A : then are BA and DA (which are manifestly equal to one another) less than any other line drawn from A to the curve. And, in the ellipse, if BE be an ordinate to the conjugate axis; and if BE and EK , perpendicular to the tangents at B and E , intersect in K ; then are BK and EK (equal to one another) greater than any other line drawn from K to the periphery of the ellipse.

Let the lines touching the conic section at B and D meet in F , and draw the diameter DC : let M be any point in the curve, and draw MN , terminated by the curve, parallel to DF , and let MN cut CD in O , and BF in L . also draw OR parallel to DA , and let it cut BA produced in R . It is manifest that $BF = FD$, and, because,

$$BF^2 : FD^2 :: BL^2 : ML \times LN.$$

Therefore, $BL^2 = ML \times LN$. Consequently, if a circle be described through the points B , M , and N , (*5. 4. E.*)

BH will be a tangent of that circle, (*37. 3. E.*): therefore, the centre of that circle is in the line BR , perpendicular to BH , (*19. 3. E.*): but the same centre is in the line OR , (*7. 3. E.*): for MN is bisected in O , and OR (parallel to DA) is perpendicular to MN , (parallel to DF): therefore, R is the centre of the circle described through the points B , M , and N . But AB is the least of all the lines that can be drawn from A to the periphery of the circle, whose centre is R , and the radius RB , (*7. 3. E.*): therefore, AB is less than AM . In like manner, it may be shewn, that AB is less than any other line drawn from A to the curve.

And the like reasoning will equally apply in the case of the ellipse, when BE is ordinately applied to the conjugate axis: but, in this case, the point R , which is the centre of the circle that passes through the points B , M , and N , will fall between the points K and B : therefore KB is the greatest line that can be drawn from K to the circumference of that circle, (*7* and *8. 3. E.*): therefore, KB is greater than KM . Therefore, KB and KE are greater than any other line drawn from K to the periphery of the ellipse.

Cor. 1. In all the conic sections, the periphery of a circle described from the centre A , with the radius AB , will touch the curve at B and D , (that is, it will touch the tangents of these conic sections at these points), and, every where else, will be wholly contained within the conic section. And, in the ellipse, the periphery of a circle, described from the centre K , with the radius KB , will touch the ellipse at B and E , and, every where else, will be wholly without the ellipse.

Cor. 2. In the parabola and hyperbola, a circle, touching the curves internally at B (not the vertex of the axis), and having a greater radius than AB , will necessarily meet the curve again in another point different from B .

For such a circle will wholly include the circle described with the radius AB ; and, consequently, it will include the point D : and, because the parabola and hyperbola are continuous curve-lines, extending to an indefinite distance both ways, therefore, they will necessarily cut the circle in two points at least, one on each side of the point D .

Cor. 3. And if a circle be described to touch an ellipse at the point B (not the extremity of either axis), with a radius that is greater than AB , but less than KB , that circle will necessarily meet the periphery of the ellipse again in another point, different from B .

For the circle described with the radius, AB , will be wholly within such a circle, and the circle described with the radius, KB , will be wholly without it: consequently, the point, D , will be within such a circle, and the point E will be without it. And, because the periphery of the ellipse is a continuous curve-line returning into itself, therefore it will necessarily meet the circumference in two points, at least, one on each side of the point D .

Lemma. Let A , B , C , and D , be four right lines, such that $A \times B = C \times D$; and let the sum of A and B be likewise greater than the sum of C and D : then the greater of the two lines, A and B , is the greatest, and the other is the least, of all the four lines.

Let A be greater than B , and E greater than D ; and, if it be possible, let C be greater than A : then, because $A \times B = C \times D$, therefore

$$C : A :: B : D.$$

Consequently, the sum of C and D is greater than the sum of A and B , (*25. 5. E.*) contrary to the hypothesis. Therefore A is greater than C and D , and B is less than C and D .

PROP. II.

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PROP. II.

Let BD , (*fig. 3* and *4.*) be ordinately applied to the axis of a parabola, or to the transverse axis of an ellipse, or hyperbola; and let a circle, which touches the conic section at B , cut the curve again in M (*Cor. 2* and *3* of *PROP. I.*): then, if MN be drawn parallel to the tangent DF , the circumference of the circle will pass through N ; and, the part of the circumference of the circle that is on one side of MN will be within the conic section, and the other part of the circumference will be without the conic section.

Produce MN to meet the tangent of the curve, drawn from B , in L . Because the tangents drawn from B and D are equal to one another, therefore, $ML \times LN = BL^2$: therefore the circle which touches the conic section at B , and passes through M , will likewise pass through N , (*37. 3. E.*)

Draw the diameter DC , cutting MN in O , and make RO perpendicular to MN . Let a line, drawn parallel to MN , or DF , cut the circle in P and Q , the conic section in T and S , the diameter DC in G , the line RO in I , and the tangent BF in K . It is manifest, that MN is an ordinate of the diameter DC : and, because RO bisects MN , one chord of a circle, at right angles, it will bisect all the chords parallel to MN . Thus $PI = IQ$, and also $TG = GS$; consequently, $KP + KQ = 2KI$, and $KT + KS = 2KG$. Since the line, RO , crosses the diameter of the conic section at the point of intersection, O , it is plain that KG is greater than KI , when the parallel is on one side of MN ; and, on the contrary, KI is greater than KG , when the parallel is on the other side of MN . Therefore, in the former case, $KT + KS$ are greater than $KP + KQ$; but, in the latter case, $KP + KQ$ are greater than $KT + KS$.

Because the tangents, BD and DF , are equal to one another, therefore $KT \times TS = KB^2$: but $KP \times KQ$ is also $= KB^2$; therefore, $KT \times TS = KP \times KQ$.

From what has now been shewn, it follows that KS is greater, and KT less than KP or KQ , (*Lem.*), when the parallel is on one side of MN ; and, on the contrary, that KQ is greater, and KP less, than KS , or KT , when the parallel is on the other side of MN . Therefore, the part of the circumference of the circle, on one side of MN , is included within the conic section; and the part of the circumference, on the other side of MN , is without the conic section.

Cor. 1. When the two points B and D are on opposite sides of the line MN , the circumference of the circle falls within the conic section on both sides of the point of contact B : but when the points B and D are on the same side of the line MN , the circumference of the circle falls without the conic section on both sides of the point of contact B .

This is manifest, when it is considered that the point D is always included within the conic section.

Cor. 2. When one of the extremities of the line MN , falls on the point of contact B , the circumference of the circle meets the curve of the conic section only in two points.

PROP. III.

Let BD (*fig. 5* and *6.*) be ordinately applied to the axis of a parabola, or to the transverse axis of an ellipse or hyperbola; and let BM be ordinately applied to the diameter of the curve drawn through D : then the circle which touches the conic section at B , and passes through the point M , is the osculating circle at the point B ; and it will cut

off, from the diameter drawn through the point of contact, a chord that is equal to the parameter of that diameter.

For the circle so described will meet the curve of the conic section only in the points B and M , (*Cor. 2. 2.*); and it will be wholly without the conic section on that side of BM on which the point D is, and wholly within the conic section on the other side of BM . And if another circle be described so as to touch the conic section at B ; then this second circle may be wholly included within the conic section (*Cor. 1. 1.*): or it may cut the curve of the conic section on the same side of BM as the point D ; in which case the circumference will likewise fall within the conic section on both sides of the point B , (*Cor. 1. 2.*): or the second circle may cut the curve of the conic section on the opposite of BM to the point D , in which case the circumference will fall without the conic section on both sides of the point B , (*Cor. 1. 2.*): or lastly, in the case of the ellipse, the second circle may be wholly without the ellipse, so as to include it. (*Cor. 1. 1.*) Now, in none of all these cases does the circumference of the second circle pass between the circumference of the first circle and the curve of the conic section on either side of the point B . Therefore the latter circle is the osculating circle, or the circle of equal curvature, at the point B .

Again, let the diameter drawn through D meet BM in O , and the diameter drawn through B meet the osculating circle in L : join ML and draw the tangents BH and DF .

Then, in the parabola, having joined LO , (*fig. 6.*); because BO , an ordinate to DO , is parallel to DF , therefore the angle $FDO =$ the angle $DOB =$ the angle OBL ; it is also manifest that the angle $FDO =$ the angle $HBL =$ (because BH touches the osculating circle) the angle BML , (*32. 3. E.*); therefore the angle $OBL =$ the angle BML ; and the triangle BLM is isosceles; and LO , which bisects the base BM , is perpendicular to BM . Hence the two triangles BOL and BDL , right-angled at O and D , are equiangular: therefore

$$LB : BO :: BO : OD,$$

consequently $BO^2 = LB \times OD$. Therefore LB is equal to the parameter of the diameter drawn through D , or to that of the diameter drawn through B .

And, in the ellipse and hyperbola, from the centre C , (*fig. 5.*) draw CP parallel to ML , and CQ perpendicular to BM : because BH touches the osculating circle, therefore the angle $CBH =$ the angle BML , (*32. 3. E.*) = the angle BPC : also, the angle $CBH =$ the angle $CDF =$ (because BM is parallel to DF) the angle MOC : therefore the angle $BPC =$ the angle MOC ; and the triangle OCF is isosceles; and CQ bisects OP . It is manifest that $BC^2 - CO^2 = BQ^2 - QO^2$, (*47. 1. E.*): but $BC^2 - CO^2 = DC^2 - CO^2 = DO \times OG$, (*5. 2. E.*): and $BQ^2 - QO^2 =$ (because $OQ = QP$) $OB \times BP$, (*5. 2. E.*): therefore $DO \times OG = OB \times BP$. Therefore

$$DO \times OG : OB^2 :: OB \times BP : OB^2, \text{ or } BP : OB.$$

Because CP is parallel to ML , therefore

$$BP : BM :: BC : BL,$$

and, $BP : \frac{1}{2} BM$, or $BO :: 2 BC$, or $DG : BL$,

$$\text{therefore } DO \times OG : OB^2 :: DG : BL.$$

Therefore the chord BL is equal to the parameter of the diameter drawn through D , or to that of the diameter drawn through B .

The preceding propositions apply only to such points of a conic

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conic section as are without an axis: for this reason it is necessary to add the following proposition to complete the theory of the osculating circles of the conic sections.

PROP. IV.

If in AB , (*figs.* 7, 8, and 9.) the axis of a conic section, a line AP be taken adjacent to the vertex, and equal to the parameter of the axis; then a circle having that line for its diameter will be the osculating circle at the vertex of the axis.

In the parabola, let HM , (*fig.* 7.) an ordinate of the axis, meet the circle upon the diameter AP in L : from the natures of the parabola and the circle. $HM^2 = PA \times AH$, and $HL^2 = PH \times HA$: hence, it is manifest that HL is less than HM : therefore the circle falls wholly within the parabola. Take AQ greater than AP and describe a circle upon the diameter AQ : make $QR = AP$; assume any point as H between A and R , and let an ordinate of the parabola drawn from H , meet the circle upon the diameter AQ in L : then, as before, $HM^2 = PA \times AH = QR \times AH$ and $HL^2 = QH \times HA$: hence it is obvious that HL is greater than HM : therefore the circumference of the circle upon the diameter, AQ , falls without the parabola on both sides of the vertex. Hence it is plain that no circle upon a diameter, such as AQ , that is greater than AP , can be the osculating circle: for, if a circle be described upon a diameter less than AQ , but greater than AP ; it will follow, from what has been proved, that the periphery of such a circle will be without the parabola on both sides of the vertex, while it will be within the circle upon the diameter AQ : that is, it will be between the two curves. And it is manifest that a circle upon a diameter less than AP , is not the osculating circle; for the periphery of such a circle will be equally within the parabola and the circle upon the diameter AP . Therefore the circle upon the diameter AP , equal to the parameter, is the osculating circle at the vertex of the parabola.

Next, let AB , (*fig.* 8.) be the transverse axis of an ellipse or hyperbola, and let HM , an ordinate of AB , meet the circle upon the diameter AP in K . Then, from the nature of the conic section,

$$BH \times HA : HM^2 :: BA : AP,$$

but also

$$BH \times HA : PH \times HA :: BH : HP.$$

Now, it is plain, that the ratio of BH to HP is greater than the ratio of BA to AP (8. 5. E. *et componendo*): therefore (10. 5. E.) $BH \times HA$, or HL^2 , is less than HM^2 ; therefore the circle falls wholly within the conic section. Take AQ greater than AP , (and, in the ellipse, less than the axis AB ;) and describe a circle on the diameter AQ : make as BP to PA , so BQ to QR ; and, it is plain that QR will be less than QA : draw an ordinate of the conic section from any point H between A and R , and let the ordinate meet the circle upon the diameter AQ in L . Then, as before,

$$BH \times HA : HM^2 :: BA : AP, \text{ or } BR : RQ,$$

$$BH \times HA : QH \times HA :: BH : HQ.$$

But the ratio of BR to RQ is greater than the ratio of BH to HQ : therefore HM^2 is less than $QH \times HA$, or HL^2 : therefore the periphery of the circle upon the diameter AQ falls without the conic section on both sides of the vertex of the transverse axis. Hence, it is manifest, as in the case of the parabola, that the circle upon the diameter AP is the osculating circle.

And, in the case of the conjugate axis of the ellipse, it may be shewn, by similar reasoning, (*fig.* 9.) that the circle upon a diameter equal to the parameter, falls wholly without the ellipse; and that a circle upon a less diameter falls within the ellipse on both sides of the vertex. Therefore, in this case also, the former circle is the osculating circle of the ellipse.

Thus have we investigated two of the most remarkable properties of the osculating circles of the conic sections, by the help of which the circles in question may be determined in every case. For, in the first place, we have proved that the osculating circle at the point B passes through M (*figs.* 5 and 6.), where BM drawn parallel to the tangent of the circle at D , cuts the conic section; and, in the second place, we have shewn that the same circle, in all cases, cuts off, from the diameter drawn through the point of contact, a part equal to the parameter of that diameter.

Huyghens's Theory of Evolute.

We shall now proceed to explain the theory of evolute and involute curves, invented by Mr. Huyghens, which will enable us to determine the osculating circles of any proposed curves. Let ABC , (*fig.* 10.) be any curve line whatsoever, having its curvature all turned one way; for the sake of assisting the imagination, the curve ABC may be conceived to be a mould of wood, or any solid materials; and let a thread, perfectly fine and flexible, be adapted to, or lapped round, the convexity of the curve, or mould; and, while one end of the thread remains immovable on the curve, let the other end, after having been stretched to any proposed point D , be moved so as to keep the thread always tight, and to unlap it gradually from the curve; then the moveable end of the thread will describe a second curve, the nature of which will depend on the given curve, and the position of the initial point D .

Mr Huyghens calls the curve ABC , from which the thread is unlapped, the evolute or *curva evoluta*; the curve, described by the moveable end of the thread, he calls *linea ex evolutione descripta*, and it is sometimes termed the evolutrix, but more commonly the involute. This last name seems to have originated from a procedure directly opposite to evolution, for if the end of the thread be moved backward on the involute, the thread will be again lapped up on the mould.

The geometrical relation, that subsists between the evolute and involute curves, when abstractly enunciated, is this; that every tangent of the evolute curve cuts the involute curve at right angles. Mr. Huyghens demonstrates this property in the following manner. Let BE , touching the evolute at B , meet the involute at E , and draw EL perpendicular to EB : let G and H be two points of the evolute on opposite sides of the point B , and HL and GK the tangents of the evolute drawn from G and H , meeting the involute at L and K ; join KB and GB , and let EB and EI intersect HL in N and I . While the thread is unfolding from the evolute, the parts of it that are detached from the curve, coincide successively with the tangents KG , EB , and HL . Hence $EB = KG + \text{curve } GB$; therefore EB is greater than $KG + \text{chord } GB$; and consequently it is greater than BK . (20. 1. E.); therefore all the part of the involute, on the same side of BE as the point G , falls within the circle described with the radius BE : consequently it falls within IE a tangent of that circle. Again, $EB + \text{curve } BH = LH$; therefore $EN + NH$ are greater than LH ; and NE greater than NL ; but NI is greater than NE , (19. 1. E.); therefore it is greater than NL ; therefore all the part of the involute, on the other

side

C U R V A T U R E.

side of BE , likewise falls within the line IE . Therefore IE touches the involute at E ; that is, the tangents of the evolute cut the involute at right angles.

From this demonstration it is easily inferred, that the circle described with the radius BE from the centre B , falls within the involute on the one side, and without it on the other side. It has already been shewn, in the preceding demonstration, that the arc EK of the evolute is within the circle. Let the circle meet HL in R , and join RB and BH ; then HR is less than $RB + \text{chord } BH$; therefore it is less than $RB + \text{curve } BH$, that is, than HL ; therefore the arc EL of the evolute is without the circle.

It is next to be proved, that the same circle is the osculating circle of the involute at the point E . It has been shewn that EN is greater than NL ; therefore, if a circle be described with a radius EQ , greater than EN , the arc of the involute between E and L will fall within that circle, (7. 3. E.); but the part of the involute between E and K is also within the same circle; for it has been shewn above, to be within the circle described with the less radius BE ; therefore the circle described with the radius BE , as well as the axes EL and EK of the involute, fall within a circle described with any radius, as EQ , greater than EN . Again, let KG meet EB in M ; it is manifest that KM is greater than ME ; therefore, if a circle be described with a radius EP less than EM , the arc EK of the curve will be without that circle, (7. 3. E.); but the part of the curve between E and L , is also without the same circle; for it has been shewn to be without the circle described with the greater radius BE , therefore the circle described with the radius BE , as well as the arcs EK and EL of the involute, fall without a circle described with any radius, as PE less than ME . Now, however little EQ exceeds EB , or however little EP falls short of EB yet the tangents HL and GK may be drawn so near to BE , as that the point N shall be between the points Q and B , and the point M between the points P and B . Therefore no circle described to touch the involute at E , with a radius either greater or less than BE , will pass between the involute and the circle described with the radius BE ; therefore this last circle is the osculating circle of the involute at the point E .

In the course of the last demonstration it has been shewn that, a circle which touches the involute will fall within that curve on both sides of the point of contact, if it be less than the osculating circle; but, it will fall without the same curve on both sides of the point of contact, if it be greater than the osculating circle.

The view that we have taken of the subject of curvature makes it necessary to prove that the rectilinear deflections from the common tangent are equal in the involute and its osculating circle. By the rectilinear deflections of an arc from the tangent, we mean the perpendicular drawn from one extremity of the line upon the line that touches it at the other extremity. The proposition that we here propose to demonstrate, does not necessarily follow from any thing before proved: and it is too important to be left undemonstrated; for, on it, hinges the whole of the application of this subject to the doctrine of central forces. The proposition may be thus enunciated: "If two arcs, $E\beta$ and $E\gamma$, (fig. 11.) equal in length, be taken on a curve and its osculating circle, the limit of the ratio of the rectilinear deflections from the common tangent is the ratio of equality." Let BE be the radius of the osculating circle, and EL the common tangent of the curve and the circle: take EP less, and EQ greater, than EB ; and with these radii let two circles be described touching EL

at E : then, as has been shewn, part of the circle whose radius is EP , will fall within both the curve and the osculating circle on either side of E , and part of the circle whose radius is EQ will fall without both the same curves on either side of E : Take EL , upon the tangent, so small that a perpendicular, drawn from L may cut the four curves in such a manner that the points p and q , when it cuts the curve and the osculating circle, may be between the points m and n when it cuts the two other circles. Then the less EP and EQ differ from EB , and the smaller EL is taken, the nearer will the points m and n come together; and the nearer will the ratio of the chords of the arcs Em and En , or the ratio of the arcs Em and En themselves, approach to the ratio of equality; and likewise, in the same circumstances, the nearer will the ratio of the deflections Lm and Ln approach to the ratio of equality: and, by taking EP and EQ nearer and nearer to EB , and EL smaller and smaller, it is plain that both the ratios just mentioned will approach to the ratio of equality without any limit. But what is true of these ratios is much more true of the ratio of the arc $E\beta$ to the arc $E\gamma$, and of the ratio of Lp to Lq : because these two last ratios are always nearer to the ratio of equality than the two first ratios. Thus, then, as the arcs $E\beta$ and $E\gamma$ are diminished, their ratio, as well as the ratio of the deflections Lp and Lq , approach continually to the ratio of equality without any limit.

The effect of every central force is to deflect the moving body from the tangent: hence it follows, from this last proposition, that it is indifferent whether we suppose the momentary motion to be performed in any curve, or in the osculating circle of that curve; because the deflections from the tangent are the same in both.

If the arc $E\gamma$ of the osculating circle be so small, that it may be considered as equal to its chord; then, from the nature of the circle, $2EB \times Lq = E\gamma^2$, or $2EB \times Lp = E\beta^2$: therefore $EB = \frac{E\beta^2}{2Lp}$; that is, the radius of curvature is directly as the square of the arc, and inversely as the deflection from the tangent, where the arc is indefinitely diminished. Hence it likewise follows, that the curvature at two points of different curves, or at two different points of the same curve, are proportional to the deflections from the tangents in very small arcs of equal length: for such deflections are inversely proportional to the radii of curvature at the two points.

The method of generating one curve by unlapping a thread from another curve, is certainly very ingenious: and it is well calculated to assist the imagination in forming clear and precise notions in a matter of no little subtilty. It demonstrates in the clearest manner this curious property of two curves, one of which cuts all the tangents of the other at right angles; viz. That the difference of two tangents bounded by the curves is precisely equal to the arc intercepted between the two points of contact. We shall now add some inferences from what has been demonstrated.

If any number of points, as R, E, L , (fig. 10.) be assumed in any curve, and if RG, EB, LH be drawn perpendicular to the several tangents, these perpendiculars will be all tangents of the evolute of the proposed curve. The point N , in which two of the perpendiculars intersect, is always without the evolute, but is the nearer to it, the less is EL the portion of the curve intercepted between the two perpendiculars: and if we suppose the arc EL to be continually diminished, while one of the perpendiculars, as EN , retains its position, the point, N , will continually approach to the point B , which will be the ultimate place of N . Thus, we see that, in any proposed curve, the positions

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of the centres of the osculating circles, and the lengths of their radii, may be deduced from the curve itself, without any consideration of the evolute: and this shews that, for any given curve, it is always possible to find a corresponding evolute.

Only one tangent can be drawn to the evolute from a point assumed in the curve: and hence, from such a point, only one perpendicular can be drawn to the involute. From a point on the convex side of the evolute, two tangents of that curve can be drawn (for the sake of simplicity we confine our attention to one branch of the evolute, having a continued curvature all turned one way): therefore, from such a point, two perpendiculars can be drawn to the involute. But, from a point on the concave side of the evolute, no tangent at all can be drawn: therefore, from such a point, no perpendicular can be drawn to the involute. Thus the evolute divides the whole plane which contains the involute into two distinct spaces; if a point be assumed in the one, two perpendiculars can be drawn from that point to the involute; if a point be assumed in the other, no perpendicular at all can be drawn; and if a point be assumed in the line of separation, then only one such perpendicular can be drawn.

We will now inquire how the length of the radius of the osculating circle, and the position of its centre, are to be determined for a curve whose equation is known. Let DA (fig. 12.) be the axis of the curve; EH, an ordinate, = y; DH, the corresponding absciss, = x; EB, the radius of the osculating circle, = R: draw BN parallel, and BK perpendicular, to DA: let ER be a small arc of the curve, and draw RS perpendicular to EH. Suppose \dot{x} and \dot{y} to denote the corresponding fluxions of the absciss

and ordinate; then $\dot{x} = RS$ and $\dot{y} = ES$: put $\frac{\dot{x}}{\dot{y}} = \frac{RS}{ES} = \tau$; and τ will be the tangent of the angle RES (radius 1), or the tangent of the angle EBN, which is plainly equal to RES; then the fluxion of that angle, or the length of the

little arc that measures the angle EBR, = $\frac{\tau}{1 + \tau^2}$: and the length of the like arc, when the radius is R, = $R \times \frac{\tau}{1 + \tau^2}$: but, from the nature of the equicurve circle, the last arc is plainly equal to the little portion of the curve

$ER = \sqrt{\dot{x}^2 + \dot{y}^2} = \dot{x} \sqrt{1 + \frac{\dot{y}^2}{\dot{x}^2}} = \frac{\dot{x}}{\tau} \sqrt{1 + \tau^2}$; therefore

$R \times \frac{\tau}{1 + \tau^2} = \frac{\dot{x}}{\tau} \sqrt{1 + \tau^2}$; whence,

$$R = \frac{\dot{x}}{\tau\tau} \times (1 + \tau^2)^{\frac{3}{2}}; \text{ where } \tau = \frac{\dot{x}}{\dot{y}}.$$

Again, the sine of the angle EBN = $\frac{\tau}{\sqrt{1 + \tau^2}}$;

And the cosine of the same angle = $\frac{1}{\sqrt{1 + \tau^2}}$;

Hence BN = EB \times cosine of EBN = $\frac{\dot{x}}{\tau\tau} \times (1 + \tau^2)$;

And EN = EB \times sine of EBN = $\frac{\dot{x}}{\tau} \times (1 + \tau^2)$;

Therefore,

$$DK = BN + DH = x + \frac{\dot{x}}{\tau\tau} \times (1 + \tau^2).$$

$$BK = EN - EH = -y + \frac{\dot{x}}{\tau} \times (1 + \tau^2).$$

The symbol τ (which is the tangent of the angle that the radius of curvature makes with the axis of the curve (radius 1) is purposely introduced, in the above expressions, to avoid second fluxions: because we are thus left at liberty to make any one of the variable quantities we please, to flow uniformly.

To illustrate these formulas, let the proposed curve be the conic parabola, of which the equation is, $4 p x = y^2$.

Then $y = 2 p^{\frac{1}{2}} x^{\frac{1}{2}}$; and $\frac{\dot{y}}{\dot{x}} = \frac{p^{\frac{1}{2}}}{x^{\frac{1}{2}}} = \frac{1}{\tau}$; hence $\tau^2 = \frac{x}{p}$,

and $\frac{\dot{x}}{\tau\tau} = 2 p$: therefore the radius of curvature = $\frac{\dot{x}}{\tau\tau} \times$

$(1 + \tau^2)^{\frac{3}{2}} = 2 p \times (1 + \frac{x}{p})^{\frac{3}{2}}$. At the vertex of the

curve, where $x = 0$, the radius of curvature is $= 2 p = \frac{1}{2}$ of the principal parameter.

To investigate the nature of the evolute, we have DK

$$= x + \frac{\dot{x}}{\tau\tau} (1 + \tau^2) = x + 2 p \times (1 + \frac{x}{p}) = 3 x + 2 p:$$

let the evolute meet the axis of the parabola at A; then DA = radius of curvature at the vertex = $2 p$; therefore AK = DK - DA = $3 x$.

Again, BK = $-y + \frac{\dot{x}}{\tau} (1 + \tau^2) = -y + 2 p^{\frac{1}{2}}$

$x^{\frac{1}{2}} (1 + \frac{x}{p}) = -y + 2 p^{\frac{1}{2}} x^{\frac{1}{2}} + \frac{2 x^{\frac{3}{2}}}{p^{\frac{1}{2}}}$ (because

$$y = 2 p^{\frac{1}{2}} x^{\frac{1}{2}})$$

Draw AM perpendicular to AD, and put AM = BK = z ; and BM = AK = u : then $u = 3 x$, and

$z = \frac{2 x^{\frac{3}{2}}}{p^{\frac{1}{2}}}$: hence the equation of the evolute is $u^3 =$

$\frac{27}{4} \times p z^2$; which shews that the curve sought is a semicubical parabola.

The arc AB of the evolute, according to what has been taught, is equal to BE - AD, or in symbols, to $2 p \times$

$$(1 + \frac{x}{p})^{\frac{3}{2}} - 2 p. \text{ Thus it appears, that any proposed}$$

arc of the semicubical parabola may be exactly rectified. The investigation we have here given is due to Mr. Huyghens; but this curious discovery was first made by Mr. Will. Neil, an Englishman and a pupil of Dr. Wallis, and from him the curve to which it relates is sometimes called *Parabola Neiliana*. The same discovery seems also to have been made, very little later in point of time, and without any knowledge of what had been done in England, by Van Heuraet, a Dutch mathematician.

Let there be proposed the equation $p^n x^{m-n} = y^m$, which comprehends all curves of the parabolic kind:

then $y p^{\frac{n}{m}} x^{\frac{m-n}{m}}$; and $\frac{\dot{y}}{\dot{x}} = \frac{m-n}{m} \cdot p^{\frac{n}{m}} x^{-\frac{n}{m}} = \frac{1}{\tau}$;

hence

CURVATURE.

hence $\tau^2 = \frac{m^2}{(m-n)^2} \times \frac{x^{\frac{2-n}{m}}}{p^{\frac{2-n}{m}}}$; and $\frac{\tau^2}{x} = \frac{m n}{(m-n)^2} \times$

$$\frac{x^{\frac{2-n-m}{m}}}{p^{\frac{2-n-m}{m}}}. \text{ Thus } R = \frac{x}{\tau} \times (1 + \tau^2)^{\frac{3}{2}} = \frac{(m-n)}{m n} \times \frac{p^{\frac{2-n}{m}}}{x^{\frac{2-n-m}{m}}} \times \left\{ 1 + \frac{m^2}{(m-n)^2} \times \left(\frac{x}{p} \right)^{\frac{2-n}{m}} \right\}^{\frac{3}{2}}.$$

In the cubical parabola, whose equation is $p^2 x = y^3$, we have $m = 3$ and $n = 2$, and $R = \frac{p}{6} \times \left(\frac{p}{x} \right)^{\frac{1}{3}} \left\{ 1 + 9 \left(\frac{x}{p} \right)^{\frac{4}{3}} \right\}^{\frac{3}{2}}$. Now, in this case, the less x is taken, or the nearer we approach the vertex of the parabola (the point where the ordinates begin), the greater does R become: so that R is infinitely great at the vertex. This is an instance of curvature infinitely small: and the same thing will plainly happen whenever the equation of the curve is such that $2n$ exceeds m .

In the semi-cubical, or Neilian, parabola, whose equation is $p x^2 = y^3$, we have $m = 3$, and $n = 1$: and $R = \frac{3p}{4} \times \left(\frac{x}{p} \right)^{\frac{1}{3}} \left\{ 1 + \frac{9}{4} \left(\frac{x}{p} \right)^{\frac{2}{3}} \right\}^{\frac{3}{2}}$. In this case, the less x is taken, or the nearer we approach the vertex of the curve, the smaller does R become; and, at the vertex, it is infinitely small. This is an instance of curvature infinitely great; and the case will be the same whenever the equation of the curve is such that $2n$ is less than m .

Thus, then, in the whole series of parabolas, comprehended in the equation $y^m = p^n x^{m-n}$, the conic parabola, which answers to the case $m = 2n$, is the only one that has a finite curvature at the vertex. In all the rest the curvature at the vertex, when compared with the circle, is either infinitely small, or infinitely great. And these several curvatures can as little be compared with one another as they can with the curvature of the circle. They form a scale of infinitely varied gradation, every step of which furnishes a new curvature, *sui generis: neque novit natura limitem*. Princ. Math. Lib. 1. Lem. ii. Schol. But this is a subject on which we must not enter; our present purpose being exclusively confined to the comparison of curve lines with the circle.

If we examine the varied curvature of one leg of the semi-cubical parabola, by means of the general expression of the radius of curvature, it will be found to pass through all possible degrees of finite curvature, constantly decreasing the farther the curve is continued. But in the cubical parabola, the case is different; for the curvature is infinitely small both at the beginning of the ordinates and when they are infinitely great. Therefore, in this parabola, the curvature must first increase and then decrease again; and there will be some point where the curvature is a maximum, or the radius of curvature less than at any other point of the curve. This point of greatest curvature will be found by treating the expression for the radius of curvature according to the rules for finding the maxima and minima of quantities.

Sir Isaac Newton has given the name of "variation of curvature" to the proportion which the fluxion of the radius

of curvature bears to the fluxion of the curve; and the logarithmic spiral, in which this ratio is every where the same, he calls a curve "equably variable." Newton's Fluxions.

We shall conclude this subject with investigating a formula for finding the osculating circles of the curves that are generated by the revolving of a "radius vector" about a fixed centre, or pole, such as the spirals. Let A (fig. 13.) be the pole, M a point in the curve, and O the centre of the osculating circle; let MN be a very small part of the curve, and join MA , NA , MO , NO ; draw MR , AP , and AQ , perpendicular to AN , MO and NO respectively. The nature of such curves is most commonly defined by assigning the relation that subsists between the radius vector AM and the angle which it makes with a line AB given by position. Put $AM = \rho$, and let the arc that measures the little angle MAN on the circle whose radius is $1, = \phi$: then $NR = \rho \phi$, and $NR = \rho$, and $MN = \sqrt{\rho^2 + \rho^2 \phi^2}$: It is plain that the triangles MNR and MAP are equiangular; hence MP (for which we shall write p) =

$$\frac{AM \times MR}{MN} = \frac{\rho^2 \phi}{\sqrt{\rho^2 + \rho^2 \phi^2}}; \text{ again, because } AM^2 = MO^2 + OA^2 - 2MO \cdot OP^2 \text{ and } AN^2 = NO^2 + AO^2 - 2NO \cdot OQ; \text{ therefore, since } MO = ON, NA^2 - MA^2 = 2MO \times (OP - OQ) = 2MO \times (NQ - MP); \text{ that is, in symbols, writing } R \text{ for } MO, 2\rho \xi = 2R p: \text{ Hence}$$

$$R = \frac{\rho \xi}{p}, \text{ a formula of easy application.}$$

The nature of the evolute will be known from the values of the radius vector AO , and the perpendicular upon the tangent AP . Now $AP = \sqrt{\rho^2 - p^2}$: and $AO = \sqrt{MO^2 - 2MO \cdot MP + MA^2} = \sqrt{\frac{\rho^2 \xi^2}{p^2} - 2 \frac{\rho \xi}{p} \rho + \rho^2} = \rho \sqrt{\frac{\xi^2}{p^2} - 2 \frac{\xi}{p} + 1}$.

In the logarithmic spiral, all the radii vectores cut the curve in the same angle: let this constant angle be denoted by m ; then, in this curve, $\frac{p}{\rho} = \sin. m$, and $\frac{\xi}{\rho} = \frac{1}{\sin. m}$: whence

$$AO = \rho \times \sqrt{\frac{1}{\sin.^2 m} - 1} = \rho \times \frac{\cot. m}{\sin. m}; \text{ therefore } MAO$$

is a right-angled triangle; and the angle $AO M$, which the radius vector of the evolute makes with the curve of the evolute, is constantly equal to the given angle m , or to the angle which the radius vector of the involute makes with the curve of the involute. Thus it appears that, in the instance of the logarithmic spiral, the evolute is not only similar to the involute, but it is precisely the very same curve in a different position. James Bernoulli first discovered this curious property; and, admiring the constant reproduction of the same curve by repeated evolutions, he desired that a logarithmic spiral should be engraved on his tomb-stone, with the inscription *eadem mutata refurgo*.

CURVATURE, *Variation of*. See VARIATION.

CURVATURE, *Double*, is used for the curvature of a line, all the parts of which are not situated in the same plane.

CURUCHE, in *Geography*, a town of Portugal, in the province

province of Alentejo, district of Aviz, with a population of 2400 inhabitants.

CURUCUI, in *Ornithology*, a name given to several species of TROGON; which see.

CURVE, in *Geometry*. The original idea, from which all our notions of geometrical magnitudes are derived, is that of a solid. From the idea of a solid, we get the notion of a surface, which is the boundary of a solid; and in like manner, from the idea of a surface, we derive the notion of a line, which is the boundary of a surface, and possesses length only without breadth or thickness.

Straight Line.

The simplest sorts of lines are those which are called straight, or right, lines. The idea of a straight line is of so simple and uncompounded a nature, that it appears difficult, if it be possible, to make it clearer by any description or definition. It will certainly not be maintained that Euclid has succeeded in his attempt to define a straight line, when he says that it is such a line as "lies evenly between its extreme points:" for the phrase here used does not convey a more clear and precise meaning than the word *straight*, which it is intended to define. We apprehend that the most philosophical course to pursue in this case is to omit defining what cannot be made clearer by definition; and fairly to take it for granted that whoever understands the English language must have a distinct idea of the meaning which the word *straight* is intended to convey. All the purposes of geometry will be answered by stating as an axiom, or self-evident inference from the idea of a straight line, that particular property which is selected to be the foundation of scientific reasoning. And this is in effect what Euclid has done; for none of his conclusions are drawn from his definition, but they all hinge on the 10th axiom, which is an inference obviously flowing from the notion we have of straight lines.

Curve Line.

It is no less difficult to give a direct definition of a curve line than of a straight line. The ancient geometers seem to have extended the appellation of a curve line (*καμπύλη γραμμή*) not only to lines, such as the circle and the conic sections, that have a regular and continued curvature, but also to lines made up of several contiguous straight lines in different directions; and even to mixed lines composed partly of straight, and partly of curve lines. We shall exclude such singular combinations from the class of curves by defining a curve line to be "that which is neither a straight line, nor composed of straight lines."

The straight line and the circle, the simplest of all the curves, are the subjects of the plane geometry. Next after the plane geometry, the ancient geometers ranked the theory of the conic sections, of which we have treated in its proper place. These two branches comprehend nearly the whole of the ancient geometry; a very few curves, devised for the solution of particular problems, and forming no connected theory, do not deserve to be distinguished as a separate branch. The most noted of the curves here alluded to are the following: the spiral of Archimedes; the conchoid of Nicomedes; the cissoid of Diocles; and the quadratrix of Dinostratus.

It may not be amiss to notice in this place a classification of lines laid down by the ancient mathematicians in their treatises on geometrical loci. The most simple of the local propositions, comprehending such as related to the circle,

they called *loci plani*; the more complex propositions, depending on the conic sections, they termed *loci solidi*; and all other local propositions, which they could not reduce to one or other of these two classes, they comprehended under the generic name of *loci lineares*, in the investigation of which they had made no advances. Pappus, lib. vii.

The instance of the "*Locus ad rectas*" will serve to illustrate what is here said. In this locus, a certain number of straight lines, as four or six, are supposed to be given by position; it is supposed too that straight lines are drawn from a point to cut each of the lines given by position in a given angle; further, in the case of four lines given by position, the ratio of the rectangle contained by two of the lines drawn from the point to cut the lines given by position, to the rectangle contained by the other two, is to be a given ratio; and, in the case of six lines given by position, the ratio of the solid contained by three of the lines drawn from the point to cut the lines given by position, to the solid contained by the other three, is to be a given ratio; then the question is to investigate from these data the nature of the line that the point will touch. The case of four right lines given by position (*locus ad quatuor rectas*) fell within the compass of the ancient geometry, and it was shewn in general to be a *locus solidus*; but, in particular states of the data, it might become a *locus planus*; that is, in this case, the point touched a conic section, and in particular circumstances, a circle, or a right line. But, in the case of six right lines given by position (*locus ad sex rectas*), the investigation surpassed the limits of the ancient geometry; and the proposition fell into the unknown class of *loci lineares*.

It is not till the time of Des Cartes that the general properties of curve lines can be considered as forming a separate branch of the mathematical sciences. This celebrated philosopher and mathematician first pointed out the application of algebra to geometry; and, by this happy thought, laid the foundation of the great modern improvements in analysis. For it requires only a superficial view of the history of the mathematics to shew that the chief modern discoveries have originated from researches into the properties of curve lines.

Let A B (*Analysis*, Plate VI. fig. t.) be a right line given by position, and A a given point in it; from A draw A C making a given angle with A B, and let P M, drawn from the point P, be parallel to A C. Then the position of the point P will be perfectly ascertained when we shall have determined these four things: *viz.* the length of the line A M; the length of the line P M; whether A M lies on the right or the left of the point A; and whether P M is above or below the line A B.

A mathematical curve line may be considered as a series of points, all of which are possessed of some common property. What is called the *equation of the curve* is merely the algebraical expression of the relation that must necessarily subsist between the lengths of the lines A M and M P, in order that the point P may have the property which is characteristic of the curve line. This equation puts it in our power to find the length of one of the lines, as M P, when the length of the other, A M, is given; and, the several points of the curve, that correspond to any proposed portions of the fixed line A B, are by this means determined, as far as the two first of the conditions enumerated above are concerned.

The line A B is called the axis of the abscissas.

The

The portion of the axis, AM , is called an abscissa; and the fixed point, A , is called the origin of the abscissas.

The line PM , parallel to AC , is called an ordinate of the curve. The ordinates are understood to be at right angles to the axis, unless the contrary be expressly mentioned.

A point of a curve is sometimes determined by two lines, as PM and PN , drawn from it parallel to two axes, AB and AC : in this case, PM and PN are called co-ordinates; and the point A , where the axes cross, is called the origin of the co-ordinates.

We shall denote the abscissa, AM , by the algebraical symbol x , and the corresponding ordinate by the symbol y .

The next thing to be considered regards the position of the abscissas in respect of the point A ; and the position of the ordinates in respect of the axis AB . On this head the rules of analysis are clear and explicit; and there is no doubt that they are just and accurate. But although these rules suggest themselves readily enough in the application of algebra to geometry, and there has been no difference of opinion about them, yet no author, that we know of, has succeeded in deducing them, in a perspicuous manner, from first principles. The doctrine of negative quantities comes into play here; a doctrine concerning which much has been written that is vague, much that is subtle, nothing that is very clear and satisfactory. The author that appears to have approached nearest to the unravelling of this part of the theory of curve lines is M. Carnot, in his "Geometrie de Position;" (See particularly the Discours Preliminaire); to which treatise we refer such of our readers as are pleased with disquisitions of this kind.

Adopting the received doctrine of positive and negative quantities, as laid down by the writers on algebra; all the positive abscissas are to be set off on one side of the point A , *Fig. 1.* as on the right-hand side; then it will follow of course, that the negative abscissas, which are of an opposite nature to the positive ones, must be set off on the left-hand side of the same point. In like manner, all the positive ordinates, whether they correspond to positive abscissas or to negative ones, are to be drawn on one side of the line AB , as on the upper side of it: and, then, all the negative ordinates, whether they correspond to positive abscissas or negative ones, must necessarily be drawn below the line AB . Thus a positive ordinate, that corresponds to a positive abscissa, will be placed above the line AB , on the right hand of the point A , as MP ; and a negative ordinate, that corresponds to such an abscissa, will be placed below the line AB , on the right hand of the point A , as MP' : and, again, a positive ordinate, that corresponds to a negative abscissa, will be placed on the left-hand of the point A , above the line AP , as mp ; and a negative ordinate, that corresponds to such an abscissa, will be placed on the left-hand of the point A , below the line AB , as mp' . Thus the equation of the curve, which expresses the relation of the lengths of the abscissas and the corresponding ordinates, is, at the same time, sufficient, with the help of the directions just laid down, to fix the relative positions of the same lines; because the rules for resolving algebraic equations not only investigate the numerical values of the unknown quantities, but likewise determine the signs that must be prefixed to these values.

It is to be remarked that what are called impossible, or imaginary, roots in algebra, have no place in the theory of curve lines. These mysterious quantities have no correspondent expression in geometry. When a known value,

positive or negative, is given to the abscissa, then every real value of the ordinate deduced from thence, whether positive or negative, will determine a point in the curve by being placed in its proper position; but the impossible values of the ordinate only mark that we are past the limits of the curve, and that we have been seeking for it, where it is not to be found.

Figure of Curve Lines.

The connection between the algebraic values of the abscissas and ordinates, and their different positions, being a capital point in the geometry of curve lines, we shall endeavour to illustrate it by a few examples.

1. *Fig. 2.* Let the equation of the curve be $p x = y^2$. The general value of y , in this equation, is $= \pm \sqrt{p x}$. And here we see that there are no ordinates corresponding to the negative abscissas; for, when x is made negative, the value of y becomes impossible; there will, then, be no part of the curve on the negative side of the origin of the abscissas. It appears also that, for every positive abscissa there will be two ordinates, both equal in length, the one positive, and the other negative. Hence, it is plain, that this curve will be one continuous line, having two legs uniting in the origin of the abscissas, extending indefinitely on both sides of the positive part of the axis, and receding constantly from it.

This curve is no other than a conic parabola, of which p is the principal parameter. The same observations will equally apply to all curves included in the general equation $p x^n = y^m$, when n is an odd, and m an even number, and m is greater than n ; such as, $p x^3 = y^4$, $p x^3 = y^6$, &c.

For the greater precision it may be proper to remark, that a curve, whose equation is $p x^n = y^m$, will be concave, or convex to the axis, according as m is greater or less than n . When m and n are equal, the equation belongs to a straight line.

2. *Fig. 3.* Let the equation of the curve be $p^2 x = y^3$; the general value of y is $= \sqrt[3]{p^2 x}$. It appears, from this expression of the value of y , that there is only one positive ordinate for every positive abscissa; and only one negative ordinate for every negative abscissa. Therefore this curve will consist of two branches, uniting in the origin of the abscissas, and extending indefinitely in opposite directions; the one above the axis of the abscissas, and the other below it.

The same will be the case with every curve included in the general equation $p x^n = y^m$, when n and m are both odd numbers.

Point of contrary Flexure.

It is plain that curves of this kind have their curvatures turned in opposite directions; for if the concavity, or convexity, of one branch be toward the right, the concavity, or convexity of the other branch, will be toward the left. In this case, the curve is said to undergo a contrary flexure; and the point, where the change takes place, is called a point of contrary flexure.

3. *Fig. 4.* Let the curve be expressed by the equation $p x^2 = y^3$. The general value of y is $= \sqrt[3]{p x^2}$. In this instance the ordinates are all positive whether x be positive or negative; and thus there is no part of the curve below the axis of the abscissas. This curve will consist of two branches diverging from the origin of the abscissas, and both on the same side of the axis.

A like figure belongs to all curves included in the equation

tion $p \cdot x^n = y^m$, when n is an even, and m an odd number, and m is greater than n .

Cuspid.

When a curve is reflected back, as happens in the present instance at the origin of the abscissas, the point where the change in the direction of the curve takes place is called a cuspis, or point of reflexion. The marquis de L'Hopital distinguishes points of reflexion into two kinds; the first kind is when the convexities of the curve, before and after the cuspis, are turned toward each other, as in the instances we have just been considering; the second kind (fig. 5.) is when the convexity of the part of the curve on one side of the cuspis is turned toward the concavity of the part on the other side of the cuspis. The second kind of cuspis was disputed by some mathematicians; but instances where it actually takes place were produced by D'Alembert, and it must now be admitted. The equation $(ay - x^2)^2 = \frac{x^5}{b}$

is an instance of a curve having a cuspis of the second kind at the origin of the abscissas.

The several cases which we have gone through deserve particular notice; and indeed they ought to be considered as elementary propositions in the theory of curve lines. For, by proper transformations, they will enable us to examine the nature of the curvature at any proposed point in any curve. To do this, we must make the point of the curve the origin of the abscissas, and take, for the axis, the line drawn perpendicular to the tangent of the curve; then the relation that subsists between the abscissas and the ordinates, when both are very small, or in a nascent state, will, for the most part, coincide with one or other of the cases above enumerated; and thus we shall discover whether the curvature is continued without interruption, or a contrary flexure, or a cuspis, takes place at the proposed point.

Conchoid.

4. As an instance of a more complex figure, let there be proposed the conchoid (fig. 6.) of the ancients, of which the equation is, $x^2 y^2 = (a^2 - x^2) \times (b - x)^2$. The general value of the ordinate is, $y = \pm \sqrt{a^2 - x^2} \times \frac{b - x}{x}$. Here,

when $x = 0$, the ordinate is infinitely great; therefore, if A K be drawn through the origin of the abscissas parallel to the ordinates, that line will no where meet the curve. But, for every positive value of x how small soever, it is plain that there correspond two equal ordinates, one positive and the other negative; therefore the curve will consist of two equal branches, one above and the other below the axis of the abscissas, which approach nearer to the line A K than any assignable distance, but no where meet it. A right line, such as A K, to which a curve continually approaches but never meets, is called an asymptote.

The points, in which a curve will cut the axis of the abscissas, will be determined by putting $y = 0$, and seeking the values of x in the resulting equation. In the present instance, when $y = 0$, then $(a^2 - x^2) \times (x - b) = 0$, whence $x = \pm a$, and $x = b$: therefore, supposing a to be greater than b , make A D and A E each $= a$, and A B $= b$; and B, D, E, will be the points in which the curve will meet the axis. It is plain that the two branches of the curve both pass through the point B, and meet again at the point D, beyond which there is no part of the curve on the positive side of A: for the ordinates change their signs when x , from being less than b , becomes greater than b ; and they

are impossible when x is taken greater than a . To examine the figure of the curve on the negative side of the origin of the abscissas, write $-x$ for $+x$ in the expression for y , then

$$y = \pm \sqrt{a^2 - x^2} \times \frac{b + x}{x}$$

: whence it is easy to infer that the curve will consist of two infinite branches, uniting at E, and extending on opposite sides of the axis along the same asymptote as before.

The part of the curve between B and D is called a *nodus*.

A point, such as B, where two branches of a curve intersect, is called a *punctum duplex*. In like manner, when three branches of a curve pass through one and the same point, that is called a *punctum triplex*. When a *punctum multiplex* takes place, there is always a certain number of equal values of y corresponding to one value of x : but the converse must not always be inferred. Thus, when two points of section coalesce into one point of contact, there is no *punctum duplex*: but if the equality of the ordinates still remains, however the equation of the curve be transformed, or to whatever axis the ordinates be referred, then we may conclude with certainty that there is a *punctum multiplex*, according to the number of equal ordinates.

When $a = b$, then the points B and D (fig. 7.) come together, the *nodus* disappears, and there is a *cuspid* at B.

When a is less than b , the curvature at D (fig. 8.) is continued without interruption, and there is neither a *nodus* nor a *cuspid*.

5. Let there be now proposed the curve whose equation is $ay^2 = (x + b)(x^2 - a^2)$. The general expression of the

ordinate is $y = \pm \frac{\sqrt{(x + b)(x^2 - a^2)}}{\sqrt{a}}$. The values of x ,

corresponding to $y = 0$, are $+a$, $-a$, and $-b$ (fig. 9.): therefore make A B and A C each equal to a , and A D $= b$, (which is supposed to be greater than a): then the curve will cut the axis at the points B, C, and D. There are no ordinates corresponding to such abscissas as are less than a : therefore there is no part of the curve between A and C, nor between A and B. When x is positive and greater than a , the corresponding ordinates will increase as x increases; and the curve, on the positive side of A, will consist of two infinite legs uniting at B. When x is negative,

then $y = \pm \frac{\sqrt{(b - x)(x^2 - a^2)}}{\sqrt{a}}$: whence it appears that

there will be an oval, or a curve enclosing space, corresponding to the part of the axis between C and D.

An oval, such as that just mentioned, which is placed apart from the other branches of the curve, is called an *ovalis conjugata*.

As b approaches nearer to a in value, the part of the axis C D, to which the oval corresponds, becomes less and less; and when b is exactly equal to a (fig. 10.), then the oval contracts into a single point; which is, nevertheless, to be reckoned a part of the whole curve belonging to the equation $ay^2 = (x + a)(x^2 - a^2)$. A single point of this sort, which, though it is detached from the other parts of the curve, yet satisfies the equation of the curve, is called a *punctum conjugatum*.

Classification of Lines.

In the course of the examples that have been adduced, the most remarkable circumstances respecting the figure of curve

C U R V E.

curve lines have been briefly noticed. To the reader, who is pleased with this speculation, and wishes to pursue it further, we recommend the perusal of sir Isaac Newton's "Enumeratio Linearum tertii Ordinis." When the scope of this doctrine is considered, it is plain that a curve line may be employed to exhibit the correlative magnitudes of any two indeterminate quantities, which depend upon one another in such a manner, that, when any values of the one are assumed, the corresponding values of the other may be thence computed. For this purpose, the given values of one of the indeterminate quantities must be made the abscissas of the curve; and then the corresponding values of the other will become the ordinates. Thus the number of curve lines is infinitely great. Hence it is necessary to introduce order into the study of this subject, by proper classification.

The great division of lines is into geometrical and mechanical.

Geometrical Lines.

The class of geometrical lines comprehends all those in which the relation between the abscissas and the corresponding ordinates is expressed by a finite algebraic equation: such are all the curves in the preceding examples. This class comprehends the straight line.

Mechanical Curves.

The mechanical curve lines are all those in which the relation of the abscissas and ordinates cannot be expressed by a finite algebraic equation. The most remarkable quantities, which cannot be algebraically expressed in finite terms, are the lengths of circular arcs and logarithms; and it is on these quantities that the most noted of the mechanical curves depend. The cycloid and the spiral of Archimedes are instances of mechanical curves derived from the circle: the logarithmic curve is an instance of one derived from logarithms; and the logarithmic spiral is an instance of one depending equally upon circular lines and logarithms. It has not been found requisite to subdivide the mechanical curves into subordinate classes.

Algebraic and Transcendent.

Many authors use the words *algebraic* and *transcendent*, in place of *geometrical* and *mechanical*, introduced by Des Cartes: and, when it is considered that the distinction signified refers solely to the nature of the equations which characterize the curves, it must be allowed that the former terms seem to be more appropriate than the latter. Leibnitz gave the name of *curvæ interscendentes* to a class which he considered as holding an intermediate rank between the algebraic and transcendent curves. This class comprehended such as had surd exponents in their equations: as, for instance, $y = x\sqrt{2}$.

Orders of Algebraic Lines.

The class of algebraic lines, which, on account of their mutual affinity, are alone capable of general discussion, are subdivided into orders according to the degrees of their equations. It hardly requires to be remarked, that the degree of any term of an equation depends only on the exponents of the indeterminate quantities, and not at all upon the invariable or given coefficients; but it must be carefully observed, that the degrees of such terms, as involve the two indeterminate quantities, are to be reckoned by the sums of the exponents of both. Thus all the terms, x^2, xy, y^2 , are homogeneous, and equally of the second degree; all these,

x^3, x^2y, xy^2, y^3 , are of the third degree; all these, $x^4, x^3y, x^2y^2, xy^3, y^4$, are of the fourth degree. When the equation of a line is freed from rational fractions, and from surds, then its order, or genus, is to be reckoned by the exponent of the homogeneous terms of the highest degree contained in it.

Complete Equation.

The equation of a line is complete when it contains all the homogeneous terms that characterize its order, and all those of all the inferior degrees. Thus the complete equations of the first, second, and third orders of lines are as follow:

1st order, $ax + by + c = 0$.

2d order, $ax^2 + bxy + cy^2 + dx + ey + f = 0$.

3d order, $ax^3 + bx^2y + cxy^2 + dy^3 + ex^2 + fxy + gy^2 + hx + ky + l = 0$.

These equations plainly comprehend all the possible varieties of one order; and what can be proved to be true of a line expressed by a complete equation, must be admitted to be a general property of all lines of that order. This distribution of lines comprehends the straight line, which forms the first order. Some authors, excluding the straight line, give the name of curves of the first order to the same class which have been ranked as lines of the second order; and, in like manner, they call curves of the second order what have been ranked as lines of the third order.

Number of Terms of a complete Equation.

It is important to know the number of terms that an equation will contain when it is complete: because this alone is sufficient to determine the number of points through which it is possible to describe a curve line of any proposed order. Now the number of homogeneous terms of the n th degree is plainly $n + 1$; and because a complete equation of the n th order contains all the homogeneous terms of all the degrees that can enter into it, therefore the number of the terms must be equal to the sum of the arithmetical series, $(n + 1) + n + (n - 1) + (n - 2) \dots + 1$; which sum is equal to $(n + 1) \times \frac{n + 2}{2}$. The number of

the coefficients of a complete equation is apparently the same as the number of the terms: but it is to be observed, that one of the coefficients may be made to disappear by division; so that, in reality, the number of arbitrary coefficients is one less than the number of the terms, and it is

therefore equal to $\frac{n^2 + 3n}{2}$. And if as many points be pro-

posed as there are arbitrary coefficients in a complete equation of any order, then the curve of the same order that will pass through all these points will be determined. For, let any line at pleasure be drawn for an axis, and let any point in it be assumed for the origin of the abscissas, and let ordinates be drawn to this axis in any given angle; then there will be as many known abscissas, with a known ordinate corresponding to each, as there are given points; and these, being respectively substituted in the equation of the curve, will furnish an equal number of equations, in which every thing is known, excepting the coefficients of the several terms. Therefore, by proceeding according to the rules for resolving simple equations in algebra, the several coefficients will be found in terms of the known abscissas and ordinates: and hence the equation of the curve sought will be completely determined. In this manner it is proved that a

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line of the second order may be described through five points; and one of the third order through nine points.

Change of the Axis.

When the equation of a curve is found for any one axis, it may be transformed into another equation, in which the indeterminate quantities shall denote the abscissas and ordinates of a new axis drawn at pleasure. As this is an operation continually wanted in the theory of curve lines, it must not be passed over without explanation. Let P, (fig. 11.) be a point, the position of which is determined by the abscissa AM = x, and the ordinate MP = y: and let AM' = z, and PM' = u, be the abscissa and ordinate of the same point referred to a new axis AC, it is required to express the first abscissa and ordinate, x and y, by means of the new abscissa and ordinate, z and u. Draw A'N and M'H parallel to AM; and A'B and M'K parallel to PM: put AB = b, and A'B = k: let the angle AMP, in which the first ordinate cuts its axis be = m, and the angle MPM', contained between the first and the new ordinates be = n, and the angle M'AN, between the two axes be = v: then, observing that the sine of the angle PM'H = sin. (m + n), and the sine of the angle AM'K = sin. (m + v), the following determinations are readily derived from the theorem in trigonometry that the sides of a triangle are proportional to the angles opposite to them; viz.

$$\begin{aligned} PH &= \frac{\text{Sin. } (m + n)}{\text{Sin. } m} \times u \\ M'K &= HN = \frac{\text{Sin. } v}{\text{Sin. } m} \times z \\ AK' &= \frac{\text{Sin. } (m + v)}{\text{Sin. } m} \times z \\ M'H &= KN = \frac{\text{Sin. } n}{\text{Sin. } m} \times u. \end{aligned}$$

Hence, because AM = AB + A'K + KN, and PM = PH + HN + A'B, we have in symbols,

$$\begin{aligned} x &= \frac{\text{Sin. } (m + v)}{\text{Sin. } m} \times z + \frac{\text{Sin. } n}{\text{Sin. } m} \times u + b \\ y &= \frac{\text{Sin. } (m + n)}{\text{Sin. } m} \times u + \frac{\text{Sin. } v}{\text{Sin. } m} \times z + k. \end{aligned}$$

If the ordinate PM' is to cut its axis at right angles, the values of x and y become,

$$\begin{aligned} x &= \frac{\text{Sin. } (m + v)}{\text{Sin. } m} \times z + \frac{\text{Cof. } (m + v)}{\text{Sin. } m} \times u + b \\ y &= \frac{\text{Cof. } v}{\text{Sin. } m} \times u + \frac{\text{Sin. } v}{\text{Sin. } m} \times z + k. \end{aligned}$$

And, if both the first and the new ordinates are perpendicular to their axes, then

$$\begin{aligned} x &= \text{Cof. } v \times z - \text{Sin. } v \times u + b \\ y &= \text{Cof. } v \times u + \text{Sin. } v \times z + k. \end{aligned}$$

If these values of x and y be substituted for them in the equation of any curve, the result will be a new equation of the same curve referred to a new axis drawn at pleasure. But however the axis of the curve may be changed in this way, yet it is plain that the order of the curve will remain unalterably the same. The two last expressions for x and y are the most useful; they contain three arbitrary quantities, viz. Sin. v, b, and k, which may be determined so as best to suit the purpose in hand.

Subordinate Species.

We are now to consider the complete equations of the se-

veral orders, with the view of classing the subordinate species contained in each.

First Order of Lines.

The complete equation of the first order of lines is $ax + by + c = 0$; which, by changing the coefficients may be brought to this form, $y = \frac{a}{b}x + c$. Here there is plainly no variety; for whatever changes be made in the coefficients or the signs, the locus of the equation is equally in all cases a right line. It is thus constructed. Fig. 12. From the origin of the abscissas A, draw AB parallel to the ordinates, and equal to c; draw BN parallel to the axis, take Bn = a, and make mn parallel to the ordinates, and = b: then the line drawn through B and m is the locus of the equation, as is manifest.

Second Order of Lines.

The second order of lines will require more discussion. The complete equation, when the arbitrary coefficients only are retained, is

$$\begin{aligned} y^2 + 2axy + bx^2 + 2cy + 2dx + e &= 0. \\ \text{This equation may be thus written,} \\ (y + ax + c)^2 - (a^2 - b)x^2 - 2(ac - d)x &= e^2 - e. \end{aligned}$$

And there are three cases to be distinguished; when $a^2 - b$ is a positive quantity; when it is negative; and when it is equal to nothing.

Hyperbola.

I. Let $a^2 - b$ be positive, and = p^2 ; and let $p^2q = ac - d$: then the equation (A) becomes, by substitution, $(y + ax + c)^2 - p^2(x + q)^2 = e^2 - e - p^2q^2$: let the left-hand side of this equation be resolved into its factors, and, for the sake of brevity, put $m = p + a$, $n = p - a$, $r = pq + c$, $s = pq - c$; and the result will be, $(y + mx + r) \times (y - nx - s) = e^2 - e - p^2q^2$, an equation which may be thus constructed: Fig. 13 and 14. Draw cde parallel to the ordinate PM, and make cd = n × Ad, and ce = m × Ad; and draw the lines AcQ, and AeR: make AH parallel to the ordinate PM, and = s, also AK = r; and draw HL and KN, intersecting in O, parallel to AQ, and AR. Then PN = PM + MR + RN = y + mx + r, and PL = PM - MQ - QL = y - nx - s: therefore PL × PN = $e^2 - e - p^2q^2$; whence it is manifest that the curve, which is the locus of the point P, is a conic hyperbola, of which OL and ON are the asymptotes. When $e^2 - e - p^2q^2$ is a positive quantity, the point P will be without the angle LON: and, in this case, if OS be drawn parallel to PM and = $\sqrt{e^2 - e - p^2q^2}$; then P will be a point in the hyperbola. But when $e^2 - e - p^2q^2$ is a negative quantity, then P will be within the angle LON: and if FG be interposed between OL and ON, so as to be parallel to PM, and = $2\sqrt{p^2q^2 + e - e^2}$; then S, the middle of FG, will be a point in the hyperbola. Thus, in every case, the general equation, when $a^2 - b$ is positive, belongs to a conic hyperbola, which passes through a given point, and has two given lines for its asymptotes.

The complete locus, in the former case, consists of the two opposite hyperbolas, lying in the angles, adjacent to the angle LON; and, in the latter case, it consists of the two opposite hyperbolas contained in the angle LON, and the angle opposite to it.

If $e^2 - e - p^2q^2 = 0$, the equation resolves itself into these two, $y + mx + r = 0$, and $y - nx - s = 0$; which are the

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the equations that determine the position of the right lines O I, and O N.

Under this head are comprehended all cases of the general equation where either y^2 , or x^2 , or both of them, are wanting.

Ellipse.

II. When $a^2 - b$ is a negative quantity; put $p^2 = b - a^2$, and $p^2 q = ac - d$, and the equation (A) will become $(y + ax + c)^2 + p^2(x + q)^2 = c^2 - e - p^2 q^2$. Because the left-hand side of this equation is essentially positive, consistency requires that the other side of it should likewise be positive; and if this condition be wanting, the inference is, that the equation is absurd, and cannot be constructed at all.

Fig. 15. Draw de parallel to the ordinate PM, and make $de = a \times Ad$; and draw AeH : make AR parallel to PM, and $= c$, and draw ROG parallel to AH: take $AK = q$, and draw KL parallel to AR. Then $PO = PM + MH + HO = y + ax + c$: also $KM = AM + AK = x + q = \frac{Ad}{Ae} \times LO$: therefore $PO^2 + \frac{Ad^2}{Ae^2}$

$p^2 \times LO^2 = c^2 - e - p^2 q^2$: make $LN = \sqrt{c^2 - e - p^2 q^2}$; and $LG = \frac{Ad}{Ae} \cdot p \times LN$: then $PO^2 + \frac{LN^2}{LG^2} \times LO^2$

$= LN^2$; whence it is manifest that the locus of the point p is a conic ellipse, of which the lines LG and LN, given in magnitude and position, are two conjugate semi-diameters.

Parabola.

III. The remaining case to be considered is, when $a^2 - b = 0$: the equation (A) becomes $(y + ax + c)^2 - 2(ac - d)x = c^2 - e$; and, by putting $2q = ac - d$, and $4qr = c^2 - e$, it is changed into $(y + ax + c)^2 = 4q(x + r)$, an equation belonging to a conic parabola.

Fig. 16. Draw de and AR parallel to PM; and make $de = a \times Ad$, $AR = c$, and $AK = r$: draw RO parallel to AeN , and KL parallel to PM: then $PO = y + ax + c$, and $KM = x + r = \frac{Ad}{Ae} \times LO$: therefore PO^2

$= 4 \frac{Ad}{Ae} q \times LO$; whence the locus of the point p is a conic parabola, having LO for one of its diameters, and the parameter of that diameter $= 4 \cdot \frac{Ad}{Ae} \times q$.

As every possible case of the complete equation of lines of the second order falls under one or other of the three heads we have separately examined, it follows that the three curves, known by the name of the conic sections, comprehend all the varieties of this order of lines. The same curves which the Greek geometers, nearly two thousand years before the time of Des Cartes, derived from the sections of a solid cone, present themselves here, under a new aspect; and their mutual affinity, as well as their characteristic differences, are as strongly marked by the varied signification of the same algebraic expression, as they are by the changes of position in a geometrical construction. It may be proper to observe that the nature of the highest member of the equation, and the species of the curve to which that equation belongs, both depend on the same quantity $a^2 - b$: for when $a^2 - b$ is positive, the highest member of the equation, or $y^2 + 2axy + bx^2$, has two real binomial factors; and the curve to which the equation, in this case belongs, is the hyperbola: when $a^2 - b$ is positive, the highest member has no real binomial factors; and the curve to which it belongs is the ellipse: and when

$a^2 - b = 0$, the highest member is a complete square, or has two equal binomial factors; and the curve is the parabola.

Third Order of Lines.

Lines of the third order are divided by sir Isaac Newton, first into four principal divisions, or genera; and these are again subdivided into no less than seventy-two different species. The purpose of classification is, in some measure, defeated, when the number of subordinate species becomes so excessively great. It will not be expected that we can enter into any detail concerning a subject occupying so large a field, and which, after all, must be allowed to be more curious than useful. The enumeration of the illustrious author is founded on the varieties of figure that result from all the possible cases of the general equation. This principle of classification is certainly not a little arbitrary. Perhaps there is less reason to be surpris'd that a few cases have been omitted, than that so complete an enumeration was made with so unsure a guide. Mr. Stirling, who has commented on the treatise of sir Isaac, has added four species to those of his author: and who will say that the enumeration is at last complete?

Some mathematicians have advanced a different principle for subdividing the orders of curves, which, they think, is less precarious than the consideration of figure. It is founded on the number of branches which run out to an infinite distance. And, as the number of such branches depends on the number of real binomial factors of that member of the equation, where the indeterminate quantities rise to the highest dimensions, it cannot be denied that there is here an analytical character fit to be the basis of a systematic arrangement. This new principle has the more imposing an aspect, as it succeeds completely for lines of the second order; where the number of different curves, as has already been noticed, corresponds exactly with the varieties of the highest member of the equation in regard to binomial factors. M.M. Euler and Cramer have both given a classification of lines of the third order founded on the number of infinite branches; and although they agree in the first or principal divisions, yet they differ from one another in subdividing these; for the former classes the whole order in sixteen genera, while the latter enumerates only fourteen. We may therefore conclude that there is something arbitrary in all the classifications of curve lines hitherto proposed; and that mathematicians have not clearly pointed out the route which is to be followed, at least in what regards the minutest subdivisions.

General Properties of Curves of all Orders.

Newton has remarked that all geometrical curve lines have properties analogous to those which the ancient geometers have demonstrated of the conic sections. In treating of so extensive a subject, the nature of our work necessarily confines us to a general view only; but as it is in tracing the properties of curve lines common to all the orders, that the superior power and excellence of the algebraic method is most to be admired, we must not pass over so interesting a part of the theory of curve lines with a general remark.

Refusing the general equation of lines of the second order, viz.

$$y^2 + 2axy + bx^2 + 2cy + 2dx + e = 0:$$

Let the position of a point, situated any where in the same plane, and referred to the same axis as the curve, be determined by the abscissa p and the ordinate q ; let a right line (making an angle denoted by m with the ordinate

q) be drawn to cut the curve, and let ξ denote the segment of this line between the point and the curve; let x and y be the abscissa and ordinate of the curve drawn from the extremity of ξ ; then, supposing the ordinates to be perpendicular to the axis, it is plain that $\xi \text{ Sin. } m = q + y$, and $\xi \text{ Cof. } m = p + x$; whence $y = \xi \text{ Sin. } m - q$ and $x = \xi \text{ Cof. } m - p$; let these values of x and y be substituted in the equation of the curve, and, for the sake of brevity, put,

$$A = \text{Sin.}^2 m + 2 a \text{ Sin. } m \text{ Cof. } m + b \text{ Cof.}^2 m$$

$$B = \text{Sin. } m p + a \text{ Cof. } m p + a \text{ Sin. } m q + b \text{ Cof. } m q - c \text{ Sin. } m - d \text{ Cof. } m$$

$$C = p^2 + 2 a p q + b q^2 - 2 c p - 2 d q + e$$

then the equation of the curve will be transformed into the following

$$A \xi^2 - 2 B \xi + C = 0.$$

And if the same substitutions be made in an equation of any order, as the n th order, that equation will be transformed into another of this form

$$A \xi^n - B \xi^{n-1} + C \xi^{n-2} \pm N = 0.$$

Now three of the terms of the transformed equation deserve particular attention. The first is the term that contains the highest power of ξ ; the coefficient of which depends only on the angle m , in which the line cuts the ordinates of the curve, and not at all upon the quantities p and q that determine the position of the point through which the line is drawn: the second is the last term, which, on the contrary, depends upon the quantities p and q , and not at all upon the angle m ; and the third is the second term, the coefficient of which involves the quantities p and q simply, without any of their powers, or products. From these observations, some general properties of curve lines may be readily deduced.

1. A right line cannot meet a curve line in more points than there are units in the number which denotes the order of the curve. For, in the transformed equation, if the quantities p and q , and the angle m , which determine the position of the cutting line, be supposed to be given, then ξ will be the unknown quantity; and every value of ξ , which satisfies the equation, will give a point common to the right line and the curve; but the number of such values cannot be greater than the exponent of the highest power of ξ , which, it is plain, is the same as the number that denotes the order of the curve.

2. If there be any number of parallel straight lines, every one of which cuts the curve in as many points as there are units in the number which denotes the order of the curve, then a straight line may be drawn to cut all the parallels in such a manner, that the sum of the segments of each of the parallels on one side of the line shall be equal to the sum of the segments of the same parallel on the other side of the line. Let the coefficient of the first term of the transformed equation, containing the highest power of ξ , be taken away by division, then

$$\xi^n - \frac{B}{A} \xi^{n-1} + \frac{C}{A} \xi^{n-2} \pm \frac{N}{A} = 0:$$

an equation which, in the present hypothesis, has all its roots real; for they are manifestly the segments that lie between the point through which the line is drawn and the several points where it cuts the curve; it follows, from what has already been noticed, that the coefficient of the second term, $\frac{B}{A}$, will be of this form $a + b \times p + c \times q$, when a , b , and c , are quantities that depend on the angle m ;

and if we suppose the angle m to be given, then we may determine p and q so that $a + b \times p + c \times q = 0$; in which case, the second term of the above equation will be wanting; but when the second term of an algebraic equation is wanting, then the sum of the positive roots is equal to the sum of the negative ones; that is, in the present instance, the sum of the segments, on one side of the point through which the line is drawn, is equal to the sum of the segments on the other side of it: now the equation $a + b \times p + c \times q = 0$ belongs to a right line, the position of which depends on the quantities a , b , and c , that is, on the angle m ; therefore, the property in question will take place for every line drawn to make an angle equal to m with the ordinates of the curve, provided it cut the curve in the requisite number of points.

The property which is here demonstrated of all geometrical curves, is analogous to what is proved of lines ordinately applied to the diameters of the conic sections; and thus the right line, determined by the equation $a + b \times p + c \times q = 0$, may, in general, be called a diameter; and the parallels which it cuts may be said to be ordinately applied to that diameter.

3. If a point be assumed in the plane of a curve, and two right lines be drawn through it, so as to be parallel to two lines given by position, and both to cut the curve in as many points as there are units in the number which denotes the order of the curve; then the continued product of all the segments of one of the right lines, between the assumed point and the several points where the line cuts the curve, will have, to the like product under the segments of the other right line, the same constant ratio, wherever the point through which the two lines are drawn, is assumed. Let p and q denote the abscissa and ordinate that determine the position of the assumed point; and let m be the angle which one of the two right lines, drawn through the assumed point, makes with q ; then the segments of this line, between the assumed point and the several points of section of the curve, will be the roots of the equation

$$\xi^n - \frac{B}{A} \xi^{n-1} + \frac{C}{A} \xi^{n-2} \pm \frac{N}{A} = 0;$$

which roots, in the present hypothesis, will be all real; therefore the continued product of the same segments will be equal to $\frac{N}{A}$, the last term of the equation; and, it is to be recollected, that N depends only on p and q , and A , only on the angle m . In like manner, if m' denote the angle which the other right line makes with q , then the continued product of the segments of this line will be equal to $\frac{N}{A'}$; where N is the same as before, and A' is derived from the angle m' , in the same manner that A is derived from the angle m ; therefore the first product is to the second product as $\frac{N}{A}$ to $\frac{N}{A'}$, or as $\frac{1}{A}$ to $\frac{1}{A'}$; a ratio which plainly depends only on the angles m and m' , and remains the same so long as the two lines are drawn parallel to two lines given by position.

Many other general properties of curve lines might be deduced from the transformation we have here used; but we have already enlarged on this subject as far as our limits will permit. The application of fluxions to the drawing of tangents, determining the points of contrary flexure, and other important parts of the theory of curve lines, will engage our attention in other parts of our work. Such of our

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our readers as wish to acquire a profound and critical knowledge of this part of the higher geometry, may consult Stirling's "Lineæ tertii ordinis Newtonianæ;" Maclaurin's "Geometria Organica;" and his other works; the second volume of Euler's "Introductio in Analysin infinitorum;" and Cramer's "Introduction a l'Analyse des lignes courbes Algebriques."

CURVE of equable Approach. See APPROACH.

CURVE of a double curvature. or *CURVE having a double curvature,* is used for a curve, all the parts of which do not lie in the same plane; that is, such as cannot be described on the same plane.

The curves commonly treated of in geometry, are supposed to be described, or to have all their points placed in the same plane; but if a curve be supposed to be described on a curve surface, in such a manner that all the points of that curve cannot lie or be situated in one and the same plane, then will the curve so described have a *double curvature*.

Monsieur Clairaut has published an ingenious treatise on curves of a double curvature. See his "Recherches sur les Courbes, à double Courbure," Paris, 4to. 1731. Mr. Euler has also treated this subject in the "Appendix to his Analysis Infinitorum," vol. ii. p. 323.

CURVE, Inflection of a. See INFLECTION.

CURVE, Quadrature of a. See QUADRATURE.

CURVE, caustic, in the higher geometry, a curve formed by the concurrence, or coincidence of the rays of light reflected, or refracted from some other curve.

Every curve has its twofold caustic; accordingly, caustics are divided into *catacaustics* and *diacaustics*; the one formed by reflection, the angle of reflection being equal to that of incidence, the other by refraction.

The genesis of these curves may be thus conceived; let $AB, A'B, \&c.$ *Plate. II. Analysis, fig. 24.* represent an infinite number of incident rays, that he all in one plane of incidence; it is evident, that after reflection or refraction, they will not belong to a single point or focus, but cut one another in an infinite number of points: then, if a curve be supposed of such a shape as to touch every one of the reflected or refracted rays $BF, B'F, \&c.$ produced, if need be, in the points $F, F, \&c.$ the curve FFF is called a caustic by reflection or refraction, as the name is applied to reflected or refracted rays. It is plain, that if two tangents $BF, B'F$ intersect one another in G , and be supposed to approach one another till they coincide, the points of contact and of intersection will also coincide; and therefore the reflected or refracted ray touches the caustic in that point of the ray, where its intersection with the next ray vanished, when they were supposed to coincide. And if two incident rays infinitely near to each other be conceived to revolve about their focus A , in the plane of incidence, the focus F or point of intersection of the reflected or refracted rays will describe the caustic above defined; which is real or imaginary, as F is the focus of converging or diverging rays.

Or, a caustic by refraction, called a diacaustic, may be supposed to be thus generated. Imagine an infinite number of rays, as $BA, BM, BD, \&c.$ (*fig. 25.*) issuing from the same luminous point, B , to be refracted from, or to, the perpendicular MC , in the curve AMD ; and so, as that CE the sines of the angles of incidence CME be always to CG , the sines of the refracted angles CNG , in a given ratio; then the curve line, which touches all the refracted rays, is called the diacaustic.

M. Bouguer observes, that there are two caustics formed at the same time, by convex and concave surfaces; and that they occasion two different images of objects seen by re-

flection from them. See his *Traité d'Optique*; or Priestley's *Hist. of Vision*," p. 233. See also on this subject, Smith's *Optics*, p. 171—181.

Caustic curves have this remarkable property, that when the curves that produce them are geometrical, they are equal to known right lines.

Thus, the caustic formed by reflected rays from a quadrant of a circle, which came at first parallel to the diameter, is equal to three-fourths of the diameter; which is a sort of rectification of curves that preceded the invention of the new doctrine of infinites, on which most of our rectifications are built.

Caustic curves are usually supposed to be the invention of M. Tschirnhausen; but it is only the name he invented. The first mention he made of them was in the year 1682, when he produced no instance but that of the caustic in a circle, which he might have learned from Dr. Barrow's *Lectiones Opticæ*, published in 1669. It would have been easy for him to have done the same for any curve, by the help of the radius of curvature published by Huyghens in his *Horologium Oscillatorium*, in 1673. It is certain this had been done by sir Isaac Newton as early as the year 1669, as appears from his *Lectiones Opticæ*, which were read that year at Cambridge, though not published till after his death, *viz.* in 1728. *Act. Erud. Lupl. ann. 1682*, p. 364. *Newt. Lect. Opt. sect. 4. Pref. Stat. Rep. Lett. tom. i. p. 50, seq.*

CURVE, Harmonical. See HARMONICAL CURVE.

CURVE Refleatoire, in *Optics*, so called because it is the appearance of the plane bottom of a basin covered with water to an eye perpendicularly over it. In this position, the bottom of the basin will appear to rise upwards from the centre outwards; but the curvature will be less and less, and at last the surface of the water will be an asymptote to it. M. Mairan, who first conceived this idea from the phenomena of light, found also several kinds of these curves; and he gives a geometrical deduction of their properties, shewing their analogy to caustics by refraction. *Ac. Par. 1740. H. 121. M. 1.* Dr. Priestley's *Hist. of Vision*, p. 752.

CURVES by the Light, or *COURBES a la Lumiere,* a name given to certain curves by M. Kurdwanowski, a Polish gentleman. He observed, that any line, straight or curved, exposed to the action of a luminous point, received the light differently in its different parts, according to their distance from the light. These different effects of the light upon each point of the line, may be represented by the ordinates of some curve which will vary precisely with these effects. Dr. Priestley's *Hist. of Vision*, p. 752.

CURVE, Exponential, is that defined by an exponential equation; that is, by an equation, wherein is an exponential quantity, *v. gr.* $x^x, a^x, \&c.$

The properties, geneses, &c. of particular curves, *v. gr.* the cycloid, conchoid, &c. See under their proper heads, CYCLOID, CONCHOID, &c. See also the preceding article CURVE.

CURVE, Logarithmic. See LOGARITHMIC.

CURVES, Radial, is a denomination given by some authors to curves of the spiral kind, whose ordinates, if they may be so called, do all terminate in the centre of the including circle, and appear like so many radii of that circle; whence the name.

CURVE, Rectification of a, denotes the finding a right line equal to a curve. For the praxis hereof, see RECTIFICATION OF CURVES.

CURVES, Regular, are such whose curvity proceeds continually in the same uniform geometrical manner. Such are the perimeters of the conic section, &c.

Such as have a point of inflection, or regression, and which being continued to a certain point, turn themselves a contrary way, are called irregular curves. Such are the conchoid, and the solid parabola, which has a square for its parameter. See FLEXION and RETROGRESSION, and CURVE *supra*.

CURVE, *Tractory*. See TRACTRIX.

CURVE, *Characteristic triangle of a*, in the higher geometry, is a rectilinear right-angled triangle, whose hypothenuse makes a part of the curve, not sensibly different from a right line. It is so called, because curve lines are used to be distinguished hereby.

Suppose, *e gr.* the semiordinate pm (*Plate Analysis, fig. 11.*) infinitely near another PM : then will Pp be the differential of the absciss: and letting fall a perpendicular, $mR = Pp$, RM will be the differential of the semi-ordinate. Draw, therefore, a tangent TM : and the infinitely small arc Mm will not differ from a right line: consequently, MmR is a rectilinear right-angled triangle, and constitutes the characteristic triangle of that curve.

CURVET, in the *Manege*. See CORVET.

CURVICAUDA, in *Natural History*, the name of a species of bee fly, very common in England, and very troublesome to horses, commonly known by the name of the *wrangle-tail*.

CURVILINEAR, or CURVILINEAL *Figures*, in *Geometry*, are spaces bounded by crooked lines; as the circle, ellipsis, spherical triangle, &c.

CURVILINEAR *Angle and Superficies*. See ANGLE and SUPERFICIES.

CURVIROSTRA, in *Ornithology*, a species of *loxia*; which see.

CURVIROSTRA *Fossilis*, in *Natural History*, the name of a species of fossil shell, found very frequently in the stone quarries of Northamptonshire, and the neighbouring counties. It is a species of cockle, and is distinguished by its beak not standing in the middle, but always inclining to one or the other side. The shell is sometimes found remaining entire, and in its native state and condition, but more frequently there is stony matter deposited in its place.

CURULE CHAIR, *Sella CURULIS*, in *Antiquity*, a high ivory chair, wherein certain of the Roman magistrates had a right to sit.

The curule magistrates were, the ædiles, prætors, censors, and consuls. The senators, who had borne these charges, were carried to senate on curule chairs, as also those who triumphed: the chair being fitted into a kind of chariot, currus; whence the origin of the word curulis.

The curule chair is used, on medals, to express a curule magistracy: when traversed by a halberd, it is the symbol of Juno, and serves to express the conservation of princesses.

CURULE *Statues*. See STATUE.

CURUPA, in *Geography*, a town of South America, in the Brazils, seated on the south side of the river of the Amazons; built by the Dutch, but now possessed by the Portuguese.

CURURUS, in *Botany*. Plum. See PAULLINIA *curura*, and *pinnata*.

CURURU *pala*, Rheed. See TABERNÆMONTANA *alternifolia*.

CURURUCA, in *Ichthyology*, the name of an American fresh-water fish, of an oblong, and not flattened body. It grows to a foot and a half in length; its mouth is very large. It is eaten in the Brazils.

CURWILLET, in *Ornithology*, the sanderling, or CHARADRIUS *Culidris*; which see.

CURZA, or CURSA, in *Geography*, a town of France, in

the department of the Golo, in the island of Corsica. It is the chief place of a canton, in the district of Corte, and contains 3407 inhabitants.

CURZAY, a small town of France, in the department of the Vienne, on the river Vone; 15 miles S.W. of Poitiers.

CURZOLA, CURSOLI, or CORCYRA *Nigra* (which see), a small island of Dalmatia, in the gulf of Venice, ceded by Ragusa to the Venetians in the year 1386. It abounds in wood, which makes the situation convenient for the building of ships, and produces good wine. It is about 30 miles long, and 8 broad, and contains one city, and several villages. N. lat. 43° 17'. E. long. 17° 4'.

CURZOLA, a town of European Turkey, at the east end of the island of the same name; the see of a bishop, and residence of a governor. It is fortified with strong walls and towers, and has a good harbour. The Turks attempted to make a descent here in the year 1507, but were repulsed by the women, after the men had fled.

CURZOLARI, an island, or rather five small islands, which are little more than rocks, in the Mediterranean, near the coast of Greece; 12 miles E. of Cephalonia.

CUSA, NICHOLAS DE, in *Biography*, sometimes styled *Cusinnus*, was born of obscure parents, at Treves, in the year 1401, but who, by his talents, attained to the high office of cardinal. On account of the severe treatment which he met with in his father's house, he entered, at an early age, into the service of the count de Manderscheidt, who, struck with his natural capacity and good talents, was at the expense of his education. He studied in the most celebrated universities of Germany and Italy, and took the degree of doctor in canon law at Padua, when about 23 years of age. He now attained to considerable preferments in the church, and was employed by pope Eugenius IV. on some very important missions, which he executed with so much satisfaction to his employer, that he was, in 1448, raised to the purple, and appointed bishop of Brixen in the Tyrol. In the year 1450, he was sent by the pope into Germany, with a view of composing the differences between the princes of that empire, and of engaging them to unite their efforts against the Turks under Mahomet II.: and, on the capture of Constantinople by that sovereign, in 1453, cardinal Cusa renewed his efforts with additional zeal to unite the Christian princes against the Turks, and addressed to pope Pius II. a refutation of the Koran, which has been mentioned with great respect as a learned and judicious performance. By this pope he was sent again into Germany, to maintain the rights of the holy see, against the claims of the secular princes; and on his return was constituted papal legate at Rome, and governor of the city. He was afterwards imprisoned by Sigismund, duke of Austria, in resentment for some of his reforms; but the duke being threatened with excommunication, was glad to release the cardinal on any terms. Cusa died in his 63d year, at Todi, a town in Umbria, in 1464, leaving behind him a high character for prudence and moderation which were ever exhibited in the undertakings devolved upon him. As an author, he was diligent and very learned on various topics; his works were published in different places where he happened to reside, but they were collected in 3 vols. fol. in 1565. The first volume is on theological subjects; the second contained his controversial pieces; and the third is devoted to mathematics, astronomy, and geography. Moreri.

CUSA, in *Ancient Geography*, a river of Africa, in Mauritania Tingitana; supposed to be the present *Ommirabâ*.

CUSANO, in *Geography*, a town of Naples, in the province of Lavora; 22 miles N.E. of Capua.

CUS-BEHAR. See COOCH-BAHAR.

CUSCASOW. See COOSCOOSOW.

CUSCO, or Cuzco, in *Geography*, the most ancient city of Peru, in South America, and still the second of that viceroyalty, Lima being the first. It was founded by the first Inca, Manco Capac (*i. e.* rich in virtue) who is supposed to have reigned in the 12th or 13th century, as the seat and capital of his empire. Having peopled it with the first Indians, who voluntarily submitted to him, he divided it into two parts, which he called high and low Cusco; the former having been peopled by Indians assembled by the emperor himself, and the latter by those whom his consort (his sister) Mama-Oello had prevailed upon to leave their wandering mode of life. Previously to his marriage, he declared himself and his sister to be children of the sun. The first part forms the north, and the latter the south division of the city. Here he founded the temple of the sun, and appointed virgins of the royal blood to serve that divinity. The houses were originally low and small, like cottages; but as the empire increased, they assumed a new appearance; so that when the Spaniards landed in these parts they were astonished at the extent and splendour of the city, especially at the magnificence of the temple, the grandeur of the palaces of the Inca, and the pomp and richness becoming the seat of so vast an empire. In October, 1534, Don Francisco Pizarro entered and took possession of it in the name of Charles V. emperor, and king of Spain. This was followed by a siege of the Inca Manco, who laid great part of it in ashes, but without dislodging the Spaniards. Here Manco Capac was crowned with the permission of Pizarro; but being afterwards defeated by the Spaniards, he retired to the mountains, and is supposed to have died about the year 1553. This city stands in a very uneven situation on the skirts of mountains, which are watered by the little river Guatanay. On a mountain contiguous to the north part of the city are the ruins of that famous fortress built by the Incas for their defence; from which it appears, that they intended to inclose the whole mountain with a prodigious wall, so constructed as to render the ascent of it impracticable to an enemy, and capable of being easily defended within. It was strongly built of free-stone, and remarkable for its dimensions and the magnitude of the stones, as well as the art with which they are combined. The internal works of the fortress, consisting of apartments, and two other walls, are chiefly in ruins, but the outward wall is standing. A subterranean passage, of singular construction, led from the palace of the Incas to the fortress: and these ruins, together with the fragments of a pavement of stone, which led to Lima, are no mean monuments of ancient art. The city of Cusco is nearly equal to that of Lima; and the latter may be called the maritime capital of Peru, whilst the former may be considered as its inland metropolis. Proudly situated amongst the surrounding Andes, and boasting its origin from the first of the Incas, Cusco still retains the majesty of a capital. Its north and west sides are surrounded by the mountain of the fortress, and others called "Sanca;" on the south it borders on a plain, which has several beautiful walks. Most of the houses are of stone, covered with red tiles; the apartments are spacious, and finely decorated; the mouldings of the doors are gilt, and the other ornaments and furniture correspond to the elegance of the buildings and taste of the inhabitants. The population of Cusco is estimated by Alcedo at 26,000; but it suffered greatly by a pestilence in 1720, and has of late years very much declined. Three-fourths of its inhabitants are said to be Indians, who are very industrious in the manufacture of baize, cotton, and leather; and they have also a taste for

painting, in which they are said to excel. Cusco is episcopal, and its bishop is suffragan to the archbishop of Lima. The cathedral is a large, rich, and handsome edifice, and, though smaller, preferred by some to that of Lima: it is served by three priests, one for the Indians of the parish, and the other two for the Spaniards. Cusco has also eight other parishes; a convent of Dominicans, the principal walls of which were formerly those of the temple of the sun; and eight others of Franciscans, Augustines, Jesuits, &c. The government of the city consists of a corregidor, and two alcaldes, chosen out of the chief nobility, according to the custom of all the cities in South America. Here are three colleges, one of which has a seminary for the cathedral, in which are taught Latin, the sciences, and divinity. The members of the cathedral chapter, besides the bishop, are the dean, archdeacon, chanter, rector and treasurer, canons, and prebendaries. There are four hospitals, one of which is supported by the tolls of the neighbouring bridge, on the Apurimac. The courts of justice are those of the revenue, consisting of two judges, a court of inquisition, and of the crossade. The diocese of Cusco comprehends 14 different jurisdictions; the first of which is that of Cusco, extending two leagues. In this district the temperature of the air is various, but in some parts the cold is intense, though both heat and cold are generally tolerable: the coldest parts produce good pasture for all sorts of cattle, and the valleys afford plenty of grain and fruits. In the "Intendancy" of Cusco, as this district is now called, with its dependency of Carahuasi, the only mines mentioned in the "Mercurio Peruano," are those of silver; 19 in number, which were successfully wrought. S. lat. 13° 25'. W. long. 71° 15'.

CUSCOWILLA, the capital of the Alachua tribe of Indians, pleasantly situated in East Florida, upon a high swelling ridge of sand hills, within 300 or 400 yards of a large and beautiful lake, abounding with fish and wild fowl. The lake is terminated on one side by extensive forests, consisting of orange groves, overtopped with grand magnolias, palms, poplar, tilia, live oaks, &c.; and on the other side by green plains and meadows. The town is composed of 30 habitations, each consisting of two houses, large and convenient, and closely covered with the bark of the cypress-tree. Each has a little spot for a garden, containing corn, beans, tobacco, and other vegetables. In the great Alachua Savanna, at the distance of about two miles, is an excellent plantation, cultivated by the whole community, of which each family has its appropriate part. Each family collects and deposits in its granary its proper share, setting apart a small contribution for the public granary, which is situated in the midst of the plantation.

CUSCUTA, in *Botany*, Dodder, (*κυστάνθη*, or *κυστάνθη*, Mod. Greek, a name applied to some parasitical plant, but it is not determined what particular one was intended, and it is equally uncertain whence the name was derived: some suppose from *κυστάνθη*, *confus*; others from the Arabic *chafsub*, or *chafsub*.) Pourn. 652. Linn. Gen. 170. Schreb. 227. Willd. 262. Gært. 376. Juss. 135. Vent. 4. 2. Class and order, *tetrandria digynia*. Linn. Wulst. Lam.. *Pentandria*. Smith. Flor. Brit. Nat. Ord. *Convolvuli*? Juss. Undetermined. Vent.

Gen. Ch. *Cal.* Perianth one-leaved, four or five-cleft, fleshy at the base. *Cor.* monopetalous, egg-shaped, or somewhat campanulate, longer than the calyx, four or five-cleft. *Stam.* Filaments four or five, awl-shaped, the length of the calyx; anthers roundish. *Pist.* Germ. superior, globular; styles two, erect, short; stigmas simple. *Peric.* Capsules globular, its lower part covered by the fleshy calyx,

lyx, two-celled, dividing horizontally. *Seeds* in pairs, somewhat globular.

Ess. Ch. Calyx four or five-cleft, inferior. Corolla monopetalous, four or five-cleft. Capsule two-celled, dividing horizontally. *Seeds* in pairs.

Obs. The number of parts varies in different, and sometimes in the same species, but is most frequently five.

So. 1. *C. europea*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Gert. tab. 62. Flor. Dan. tab. 199. Eng. Bot. 378. (*C. major*; Bauh. Pin. 219. Cassutha; Fuchs. Hist. tab. 348.) "Flowers nearly sessile; corolla without scales; stigras acute." *Root* annual, small, soon perishing. *Stems* red, filiform, twining, parasitical, leafless, smooth, throwing out small tubercles by which it roots itself into the bark of other plants, and derives nourishment from them after its proper root has withered away. *Flowers* in fascicles, lateral, somewhat transparent, reddish, generally five-cleft; corolla bell-shaped; stamens inserted into the throat of the corolla, alternate with its segments; styles divaricated. A native of Great Britain, on thistles, nettles, and other plants, but rare. Found near Aberdeen and in Cambridgeshire. 2. *C. epithymum*. Lesser dodder. Mart. Lam. Ill. Smith Fl. Brit. Eng. Bot. 55. (*C. europæa* β; Linn. Sp. Pl. Lam. Enc. Willd. Epithymum, five *Cuscuta minor*; Bauh. Pin. 219.) "Flowers sessile, with a fringed scale inserted into the corolla at the base of each stamen; stigras acute." Less than the preceding. *Stems* twisted. *Flowers* clustered; corolla white, funnel-shaped, with a short tube, generally four-cleft; calyx red; stamens inserted into the throat of the corolla, alternate with its segments, having at the base of each a crescent-shaped scale incumbent on the germ; styles elongated, acute. Common in Great Britain, especially in the southern counties of England, on beans, grass, and various other plants, to which it is so pernicious that it is called by the common people Devil's-guts, or hell-weed. Dr. Smith, we believe, is the first botanist who has pointed out the true specific difference between these two plants. Professor Martyn and La Marck had previously separated them, but without being aware of their distinguishing characters. La Marck, in particular, questioned whether they are sufficiently distinct, and has even figured epithymum under the name of europæa. 3. *C. americana*. Linn. Sp. Pl. 2. Mart. 3. Lam. Ill. 4. Willd. 2. (*C. floribus pedunculatis*; Jacq. Amer. 24. *C. inter majorem & minorem*; Sloan. Jam. Hist. t. 201. tab. 120. fig. 4. *C. ramosa repens*; Brown. Jam. 149.) "Flowers peduncled, five-cleft; corolla tubular; border small, spreading." *Stems* much branched, leafless, twining, parasitical, tender, shining, yellowish. *Flowers* greenish, inclining to yellow, small, clustered, scentless; common peduncles very short; calyx withering; the colour of the corolla, egg-shaped, five-cleft; segments roundish, blunt, concave, short, converging; corolla cylindrical; tube the length of the calyx; scales five, fringed, converging, attached to the petal below the stamens; filaments always five, upright, from the upper part of the tube, the length of the corolla; anthers oblong, erect; styles little longer than the corolla; stigmas capitate. *Seeds* convex on one side, flattish on the other, one, two, or three often abortive. A native of North America and the West Indies, on shrubs and trees. According to Sloane, the stems are very strong, stretching themselves over very large trees, and whole fields and pastures. 4. *C. africana*. Willd. 3. (*C. americana*; Thunb. Prod. 32.) "Peduncles one-flowered; corollas five-cleft." *Stem* filiform, more slender than in the preceding species. *Flowers* smaller; peduncles with a lanceolate bracte at the base. A native of the Cape of Good Hope,

on trees. Linnæus found this species growing on a dried specimen of *myrica æthiopica*, and described them both together as one plant in the first edition of his *Species Plantarum*, under the name of *scinus myricoides*; and in the appendix to the second, under the name of *schrebera schiroides*. 5. *C. monogyna*. Willd. 4. Vahl. Symb. 2. 32. (*C. lupuliformis*; Mart. 5. Krock. Siles. tab. 36. *C. orientalis viticulis crassissimis*; Tourn. Cor. 45. *C. major caulibus lupuli*; Buxb. Cent. 1. 15. tab. 23.) "Flowers peduncled, monogynous." The habit of *Cuscuta americana*, but twice the size. Segments of the calyx egg-shaped, shining. *Corolla* twice the length of the calyx, narrowed above, permanent, edged with lanceolate teeth. *Style* single, thicker, and shorter than in the other species. *Stigma* thick, somewhat globular. *Pericarp* the size of a pepper-corn, mucronate with the permanent style and stigma. *Seeds* compressed, somewhat kidney-shaped. Vahl. Willdenow observes that Vahl and Krock's plants are certainly the same; for, in the figure of the latter, the flowers are peduncled, and the permanent single style is conspicuous on the fruit. According to Krock, the stem is round, branching, very thick like hop-binds, with reddish-green or brown-purple bark, rough, and studded with purplish stiff rising grains resembling millet. *Flowers* in racemes coming out laterally, an inch or two in length, sometimes branched, scattered, solitary, or only two or three together, not glomerate; corolla four-cleft, reddish-white; calyx covered with a fleshy skin, green, or tinged with purple. *Capsule* large, covered with the same skin. *Seeds* wrinkled, rounded. A native of Silesia and the Levant. 6. *C. chinensis*. Lam. Enc. 2. Ill. 1718. Willd. 5. "Flowers panicled, five-cleft; calyx angular, nearly the length of the corolla." *Root* annual. *Stem* pale or yellowish green, a little thicker than in *C. europea*. *Flowers* white, in lax fascicles, on short branched peduncles, forming a kind of irregular panicle; calyx of the same colour as the corolla; corolla oval, almost globular, narrowed at the mouth, with five acuminate horn-like segments; stamens five, small; germ large, globular; styles very short, revolute, and reclining on the germ; stigmas somewhat capitate. This plant was seen in flower by La Marck in the royal garden at Paris, in 1784, twined about an ocymum, the seeds of which had been sent from China, and with which its seeds must have been intermixed.

Ventnat observes that it is not easy to determine to what natural family this singular genus belongs, on account of the difference which prevails among botanists with respect to the structure of the embryo of its seeds. Linnæus pronounces it acotyledonous; Adanson and Gærtner consider it as monocotyledonous; and Jussieu presumes it to be dicotyledonous.

CUSCUTA altera & *major*; Camel. Petiv. See *CASSYTA filiformis*.

CUSCUTA baccifera barbadensium; Plum. See *CASSYTA filiformis*.

CUSCUTA, Rumph. 5. tab. 184. fig. 4. See *CASSYTA filiformis*.

CUSCUTA foliis subcordatis; Hort. Cliff. See *BASELLA rubra*.

CUSCUTA ramis arborum innascens, caroliniana; Pink. See *TILLANDSIA usnicoides*.

CUSCUTA rumbut-putri; Rumph. See *CASSYTA zeylanica*.

CUSE, in *Geography*, a small town of France, in the department of the Doubs; 15 miles S.E. of Vesoul.

CUSH, or as some write it CHUS, in *Biblical and Ancient History*, was the eldest son of Ham and grandson of Noah; and,

and, according to Josephus, the father of the Ethiopians, who were, in his time, called Cushians, not only by themselves, but by all the inhabitants of Asia. Others conceive it to be more probable, that he seated himself in the south-eastern part of Babylonia, and in the adjoining part of Susiana, still called Khuzestân or Chusitan, the land of Chus; from whence his posterity, in the succeeding generations, might have passed into other countries. It appears from Scripture, that a part of Arabia, near the Red Sea, was named Cush. Cushan and Midian are joined together, as the same or neighbouring people, dwelling in tents; and, in other places, the Arabs are made to border on the Cushites, who, therefore, cannot be the Ethiopians: in a word, by Cush in Scripture is always to be understood Arabia. As for those texts which are alleged to prove that Cush is sometimes taken for Ethiopia, they may also be expounded of Arabia. Cush, according to the Arabian and Persian traditions, which name him Cutha, was king of the territory of Babel, and resided in Irak, where two cities existed of his name; and hence Dr. Hyde concludes, that Cush reigned in Babylonia, and that his descendants removed into Arabia, though it is difficult to assign the peculiar habitations of any of them: and this uncertainty has given occasion for supposing Cush to be Ethiopia, and for spreading these people all along the coast of Africa to the extremity of Mauritania.

Among the Abyssinians, as Bruce informs us in his *Travels* (vol. i. p. 376.) it is a tradition, derived, as they say, from time immemorial, and equally received among Jews and Christians, that almost immediately after the flood, Cush, grandson of Noah, with his family, passing through Atbara from the low country of Egypt, then without inhabitants, came to the ridge of mountains which still separates the flat country of Atbara from the more mountainous high-land of Abyssinia. This tradition says, that terrified with the apprehension of another deluge, that awful event being recent in their minds, they chose for their habitation caves in the sides of these high mountains, where they might be secure, and where the adjacent country was fertile and pleasant. Whatever might be their motives, here, it is said, the Cushites, with unparalleled industry, and with instruments now unknown, formed for themselves commodious habitations in mountains of granite and marble, several of which remain entire to this day, and promise to be of much longer duration.

As the Cushites became populous, they occupied habitations in the neighbouring mountains, and gradually extended the industry and arts which they cultivated, as well to the eastern as to the western ocean; but they never descended from their caves, nor chose to reside at a distance on the plain. Many of their descendants still occupy the same mountains and houses of stone, similar to those which their ancestors made for themselves in the beginning of their settlement. The Abyssinian tradition further says, that they built the city of Axum at an early period, in the days of Abraham. Soon afterwards they extended their colony to Atbara, where, as Herodotus informs us (lib. ii. c. 29.), they successfully pursued their studies, from which Josephus says (*Antiq. Jud.*) they were called "Meroëtes," or inhabitants of the island of Meroë. From Meroë they probably, in process of time, stretched on to Thebes. While these improvements were advancing in the central and northern territory of the descendants of Cush, their brethren to the south extended themselves along the mountains that run parallel to the Arabian gulf, in the country called "Saba," or "Azabo;" which was the principal mart and source of supply for the Abyssinian myrrh and frankincense. The

northern colonies of Cushites, proceeding from Meroë to Thebes, were intent upon the improvements of architecture, and building of houses; and substituting these for their caves, became traders, farmers, and artificers of various descriptions, and even practical astronomers, from having a meridian night and day free from clouds, such as that of the Thebaid. Letters too, at least one sort of them, and arithmetical characters, we are told, were invented by the Cushites of the middle regions; while trade and astronomy, the natural history of the winds and seasons, necessarily employed that part of the colony that was established at Sofala, moved to the southward. The nature of the commerce of the Cushites, the collecting of gold, the gathering and the preparing of their spices, necessarily fixed them perpetually at home; but their profit lay in the dispersion of these spices through the continent; otherwise their mines, and the trade produced by the possession of them, would be of little avail. The Cushites of course needed carriers; and such were presented to them among their neighbours, who lived in plains, having moveable tents or habitations, attended their numerous herds, and wandered from the necessities and particular circumstances of their country. These people were in the Hebrew language called "Phut," and in all other languages "Shepherds," a name they still bear, subsisting by the same occupation. (See SHEPHERDS.) The whole employment of the shepherds had been the dispersion of the Arabian and African commodities all over the continent; by which employment they became a great people: as that trade increased, their cattle increased also, and consequently their number, and the extent of their territory.

The learned Bryant traces the appellation *Chus*, by the aid of etymology, through a variety of ramifications and changes; and discovers traces of it in the names of places, and the manners and rites of their inhabitants, through various and very remote regions of the globe. Chus, he says, in the Babylonish dialect, seems to have been called "Cuth;" and many places where his posterity settled were styled Cutha, Cuthaia, Cutaëa, Ceuta, Cotha, and Cothon. Thus Chusitan, east of the Tigris, which was the land of Chus, was likewise called Cuthæ and Cissia by different writers. Chus was the father of those nations, denominated Ethiopians, who were more truly called Cuthites and Cushians; and who were more numerous and more widely extended than persons have imagined. The author to whom we now refer traces the origin of the Cushites or Cuthites to the first settlement of the descendants of Noah soon after the deluge. Their several abodes were assigned them, as he conceives, by the immediate appointment of God. The children of Shem were particularly regarded in the general distribution; and they were fixed near the place of their separation. They had in general Asia for their lot, as Japhet had Europe, and Ham the large continent of Africa. The children of Chus, however, would not submit to the divine dispensation; and his son, Nimrod, who first assumed regal state, drove Ashur, one of the sons of Shem, who had been settled on the western side of the river Tigris, from his demesnes, and forced him to take shelter in the higher parts of Mesopotamia. The sons, disobeying the divine order, which arranged the habitations of the posterity of Noah, went off under the conduct of the arch-rebel Nimrod; and, after having remained for a long time in a roving state, arrived at last in the plains of Shinar. These they found occupied by Ashur and his sons, who had been placed there by divine appointment. Him they ejected, and seized upon his dominions; which they immediately fortified with cities, and laid the foundation of a great monarchy. This ejection of Ashur, as Mr. Bryant thinks, happened after the general migration;

migration; and when the Cuthites had ejected Ashur, they afterwards trespassed upon Elam, in the region beyond the Tigris. The dispersion from Babel, according to this writer, did not include the whole of mankind, but related chiefly to the sons of Chus; whose intention it was to have founded a great, if not an universal, empire: which was frustrated by this event. The Cuthites had many associates, probably out of every family, who were apostates from the truth, and had left the stock of their fathers and the worship of the true God, in order to follow the rites and worship of the Cuthites. These were the persons who, fearing that they might be separated and scattered abroad, built the tower of Babel, as a land-mark to which they might repair; and Mr. Bryant suggests, that it was probably an idolatrous temple, or high altar, dedicated to the host of heaven, from which they were never long to be absent. That the sons of Chus, who wished to remain where they first settled, instead of occupying the countries to which they were appointed, were the chief agents in erecting the tower of Babel, and in prosecuting these rebellious principles, is plain from the passage, in which it is said of Nimrod, the son of Chus, that "the beginning of his kingdom was Babel." The defection, as our author imagines, was not general, nor the judgment universal; for it is not likely that all mankind should co-operate with this tyrant. The confusion of speech and consequent dispersion related merely to the Cuthites of Shinar and Babylon, and to their adherents, who seem to have been a very numerous body. The dispersion of the Cuthites is an event referred to, directly or indirectly, by many ethnic writers: and our author says, that it is manifestly to be discovered under the fable of the flight of Bacchus; and the disunion of that moveable body, which made so bold a stand, and the scattering of them over the face of the earth, are represented under the fable of dismembering the same person. Our author discovers traces of the rebellion of the Cuthites in the wars of the giants and Titans, described by ancient writers, and of their appellation in the people called Scythians. As these people were the first apostates from the truth, they introduced the worship of the sun, and paid similar reverence to the stars, and the whole host of heaven. They regarded them as fountains, from whence were derived to men the most salutary emanations. This worship was styled the fountain worship. One of the titles of the Cushan shepherds, who came into Egypt, was deduced from this worship, and derived from "El-Ain," the fountain of light, which they worshipped. The golden age of the poets was, according to our author, the age of Chus, denominated by the Greeks Chusos, and Chrusos.

These Cuthites, the sons of Chus, who seized upon the region of Babylonia and Chaldæa, and constituted the first kingdom upon earth, and who were called by other nations Cushan, Cushans, Arabians, Oreitæ, Erythreans, and Ethiopians, were an ingenious and knowing people, and at the same time very prolific. They combined with others of the line of Ham; and were enabled, at a very early period, to carry on an extensive commerce, and to found many colonies; so that they are to be traced in the most remote parts of the earth. A large body of this people invaded Egypt, in its infant state, when it was composed of small independent districts, artless and unformed, without any rule or polity. They seized the whole country, and held it for some ages in subjection, and from their arrival the history of Egypt commences. The region between the Tigris and Euphrates, where they originally resided, was styled the country of the Chusdim or Chaldim: but by the western nations Chaldæa. It lay towards the lower part of the Tigris, to the west, and below the plain of Shinar. On

the opposite side to the east was the province of Elam, which country they seem soon to have invaded, and to have occupied the upper part. This country consisted of that fine region called afterwards Susiana, and Chusistan, which was watered by the Ulai, Chobar, and Choaspes, and by other branches of the Tigris. When the Persians gained the sovereignty of Asia, it was from them denominated Persis, which was only another name for Cutha: for the Persians were the Cuthites of that country, under a different appellation. This Cutha was by the Grecians called Scythia. It extended far towards the east, and was in great measure bounded by Media to the north. This is one of the countries called Cuthan in scripture; and by other people it was rendered Ethiopia. The Ethiopians were, therefore, Cuthites or Cushans. Accordingly Eusebius says (Chron. p. 11.) that Chus was the person from whom came the Ethiopians; an appellation formed from $\alpha\delta\delta\alpha$ and $\sigma\lambda$, and derived from their complexion. This was a sacred term, a title of the chief deity, whence it was assumed by the people, who were his votaries and descendants. The sons of Chus came into Egypt under the name of Auriæ and shepherds, and also of Ethiopians, whence Egypt inherited the name. The Cuthites also settled at Colchus, the Colchis of the Greeks, whence it was called Cutaia and Ethiopia. They likewise came under the titles of Casus and Belus into Syria and Phœnicia, where they founded many cities; and we are informed by Strabo (l. 10) that this country was called Ethiopia. Eubæa and Samothræe were distinguished by a similar appellation. The extreme settlement of this people was in Spain, upon the Bœtis, near Tartessus and Gades; some of whom traversed a great part of Africa, and others gained possession of different parts of the sea-coast. Some of the same family were found on the coast of Mauritania. The original Ethiopia was the region of Babylonia and Chaldæa, where the first kingdom upon earth was formed, and the most early police instituted. Here also the first idolatry began. And as the Scythæ, or Cuthites, were the same people, it is no wonder that they are represented as the most ancient people in the world; even prior to the Egyptians. Another title by which the Cuthites were distinguished was that of Erythreans; and the places where they resided received it from them. The Cuthite Erythreans, who settled near Midian, upon the Sinus Elanitis, conferred this name upon that gulf, and the Persian sea was distinguished by the same denomination. Upon the whole, our author concludes by reciprocal evidences from the most genuine history, that the Cuthites, Ethiopians, and Erythreans were the same people; and that they had a more general name of $\Sigma\upsilon\theta\alpha\iota$, Scythai. Mr. Bryant farther undertakes to shew, that not only the Scythæ of Colchis, Mœsia, and Thrace, with those upon the Palus Mœotis, were in great measure of the race of Chus; but that all nations styled Scythian were in reality Cuthian or Ethiopian. Having seized upon the province of Susiana, and Chusistan, they possessed the navigation of the Tigris downwards; and probably commenced a very early trade. They obtained footing in India, where they extended themselves beyond Gedroña, and Carmania, upon the chief river of the country. They also occupied various parts of India; and the same people who imported their religious rites and science into Egypt, carried the same to the Indus and Ganges, and still farther into China and Japan. Some colonies undoubtedly came from Egypt; but the arts and sciences imported into India came from another family, even the Cuthites of Chaldæa; by whom the Mizraim themselves were instructed, and from Egypt they passed westward. Hence we need not be surpris'd, if we find the same customs in India, or the same names of places as are to be met with in Egypt, or

Colchis, or the remotest parts of Iberia. Many instances of this kind are produced by the learned etymologist.

The sons of Chus, however distinguished, whether they be called Oritæ, Arabians, Ethiopians, or Erythreans, were in all places celebrated for science. They were sometimes called Phoinices, and those of that name in Syria were of Cuthite extraction. The Mizraim, who settled in Egypt, before the dispersion of the Cuthites and their adherents, had no share in their rebellion, nor in the Titanic war, which ensued. Their country was that which in aftertimes was known by the name of Upper Egypt. When the Cuthites, or Titanic brood, were driven from Babylonia, they fled to different parts; and a large body of them betook themselves to Egypt. Confederate and well-disciplined, they easily overcame a nation so rude and unexperienced as the Mizraim. They soon took Memphis, the frontier town of Egypt, and afterwards over-ran the whole region above, and kept it in subjection. The Cuthites or Ethiopians were also called Arabians, and the province of Cushan in Egypt, the same as the land of Goshen, was denominated the Arabian nome, which was the best of the land of Egypt. They were also styled Hellenes, Phœnices, and Auritæ. The people so called were the first who reigned in Egypt; and with them, as we have before observed, the history of the people must commence. Manetho informs us, that the whole body of this people had the appellation of royal shepherds; a title which Bryant conceived was more particularly given to their kings. They borrowed this mark of distinction from their ancestors in Babylonia; among whom it seems to have been common. It is somewhat remarkable that Nimrod, the first tyrant upon earth, should have masked his villainy under the meek title of a shepherd. From him it was derived, and transferred to other kings, in Chaldæa, and afterwards in Egypt. At the time when the Cuthite Ethiopians arrived, Lower Egypt was very much a kind of morass; but under their direction it was drained by numerous canals, and rendered the most beautiful country in the world. They carried a sluice from the Pelusian branch of the Nile to the western gulf of the Red Sea. The chief of the pyramids at Cochoe are said to have been erected by them. They raised the most ancient obelisks in Egypt, which were marked with hieroglyphics, curiously wrought, and these were the sacred characters of Egypt, known only to the priests, and which had been introduced by the Cuthite Ethiopians. After the Cuthites had drained Lower Egypt, and had built cities there, every city had probably some sacred emblem, as the goat, hawk, ibis, crocodile, or dog, represented in sculpture, either upon the gates, or upon the entablature of their temples. This characteristic denoted its name as well as the title of the deity, to whom the place was sacred; and the deity in those cities was often worshipped under such particular symbol. Some of the poets allude to this. They have represented the dispersion of the sons of Chus from Babel as the flight of the gods into Egypt; where they are supposed to have sheltered themselves under the form of these sacred symbols. After the Cuthite shepherds (see SHEPHERDS) had been in possession of Egypt about 260 or 280 years, they were obliged to retire to the amount of 240,000 persons. The Egyptians succeeded to the Cuthites in their cities and temples; and having been initiated in their rites never forsook them. When the Cuthites were ejected from Egypt, they withdrew to many parts; and particularly to the coast of Syria; which they occupied under the titles of Belidæ, Cadmians, and Phœnices. Hence they went to Hellas, to Etruria, and Iberia, and the coast of the great Atlantic. A colony also settled at Colchis, and upon different parts of the Pontic region. Where-

ever they came they were in every respect superior to the natives; they were skilful in physic, and the knowledge of the properties of herbs; they cultivated the vine; and taught the composition of fermented liquors. They opened roads, formed causeways, and drained stagnant waters in the countries, whither they migrated; but their achievements in these ways have been attributed to some one hero, either Oloris, Hercules, or Bacchus. Their religion consisted in the worship of the sun, under various titles; to this were added divine honours, paid to their ancestors, the Baalim of the first ages, which was attended with particular mysterious rites. In these were commemorated the circumstances of the deluge, and the history of the great patriarch, through whom mankind was preserved. The Cuthites who settled in Sicily seem to have been a very powerful and intelligent people; but those of Etruria were far superior. The two most distant colonies of the Cuthite family westward were settled upon the Atlantic ocean; the one in Europe to the north; the other opposite at the extreme part of Africa in the country called Mauritania, inhabited by the Atlantic Ethiopians. They considered themselves as of the same family with the gods: and they were undoubtedly descended from some of the first deified mortals. Those who occupied the provinces of Iberia and Bœtica, on the other side, were distinguished by the same title, and preserved the same histories. They were of Erythrean and Ethiopic race; and gave name to the island Erythra, or Erythia, which they occupied for the sake of trade, and where stood the city Gadara, said to be of high antiquity.

Mr. Bryant has shown, that a great resemblance once existed between the numerous colonies of the same family. They carried the art of weaving, first practised at Arach in Babylonia, and thence extended to other neighbouring cities, and in process of time to the most remote parts of the world, to a high degree of excellence. The people of Egypt were famous for this manufactory. They were famous for their flax and linen at Colchis, Campania, Bœtica, and other parts of Spain. The Indi were also noted for this manufacture. The art of dyeing was also discovered by people of this family. The wonderful art of managing silk, and of working up cotton, was found out by the Indian Cuthites, and from them it was transferred to the Sere. To them are also attributed the game of chess; and the use of those cyphers, or figures, commonly called Arabian. They are said to have written letters *εσσιςσι*; but whether by this was meant really linen; or whether we are to understand a kind of paper manufactured from it, is uncertain. (See PAPER). Those who cultivated the grape brought it to the highest degree of perfection. The Mareotic wine, produced in Scythia Ægyptiaca, is well known, and has been highly celebrated. Calybon in Syria, Cyprus, Crete, Cos, Chios, and Lesbos, were famous on the same account. The fine wine of Sicily, of Thrace, and of Campania, in which country were the Falernian and Formian grapes, was in high repute among the ancients. In Iberia and Mauritania they had some of very noble growth. (Strabo, l. xvii. p. 1182.) There was also wine among the Indian Ethiopians, particularly in the country of the Oxydrace, who were supposed to be the descendants of Bacchus. (Strabo, l. xv. p. 1108.) They had also a strong drink made of rice, which was used in their sacrifices. The people of Latitania and Bœtica made a fermented liquor called "Zuth," the knowledge of which was derived from Egypt, in which they were supposed to have been instructed by Oloris. Hesychius calls it wine, and says it was made of barley. It is also mentioned by Strabo, (lib. iii. p. 233.) In short, all of the Cuthite family were renowned for their wisdom.

The

The natives of Colchis, who were of the Cuthite race, were devoted to magic, and had their nightly orgies in honour of the moon: and among the different branches of this family we discover an extensive acquaintance with the properties and uses of different herbs. But they were pre-eminently distinguished by the mighty works and edifices, which they carried on and erected in the different parts where they settled. All those mounds and canals, the high roads and stately structures, which have been attributed to Semiramis of Babylon, were the works of these people. They formed vast lakes, and carried on canals at a great expence; and they opened roads over hills, and through forests, which were before impassable. (Strabo, lib. xvi. p. 1071.) The stately structures of various kinds erected in Egypt were the works of the Cuthites; those Arab shepherds, who built Heliopolis or Balbec, and who were the γίγαντες, the giants and Titans of the first ages. The pyramids of Egypt are also ascribed by Mr. Bryant to these people. (See PYRAMID.) The buildings, which the Cuthites erected, were in many places styled Cyclopiæ, from a title given to the architects. Many ancient edifices in Sicily were of their construction; for they seem to have been the first inhabitants of this island. They were called Læstrygones and Lamii; and resided chiefly in the Leontine plains, and in the regions near Ætna. They erected many temples; and likewise high towers upon the sea-coast, and founded many cities; some of the ruins of which are still extant.

The noble character of the Cuthites, who by their extraordinary inventions and improvements were regarded as general benefactors to mankind, was, however, greatly tarnished by their cruelty; for which they seem to have been infamous in all parts, and which seems to have been derived from their rites and religion, that had always a tendency to blood. The Cuthæ upon the Mæotis, and in the Tauric Cherfoneus, are described as very inhospitable; and all those in their vicinity were of a savage cast, and guilty of great barbarity. In various parts they also contracted a habit of robbery and plunder; so that they lived in a state of piracy, making continual depredations.

We have already hinted, that one of the most considerable colonies which went from Babylonia, was, that of the Indi, or Sindi, called Eastern Ethiopians. They settled between the Indus and Ganges, and one of their principal regions was Cuthaia, rendered by the Grecians Cathaia. They traded in linen and other commodities, and carried on an extensive commerce with the provinces to the south. A large body of them passed to the north, under the name of Siceæ and Sacæans, who ranged very high, and got possession of Sogdiana, and the regions upon the Iaxartes. From thence they extended themselves quite to the ocean. These sent out large bodies into different parts; and many of the Tartarian nations are descended from them. They gained possession of the upper part of China, which they denominated Cathaia; and Japan was probably in some degree peopled by them. Their religion also extended far; and many noble edifices in various parts of the East afford evidences of their original. Near Syriam in Pegu are two temples, built after the same model; and other temples and pagodas in India, together with the deities to whose service they were consecrated, and the rites of worship practised in them, testify their original. For other particulars relating to the sons of Cush or Chus, or the ancient Cuthites, see the "Analysis of Ancient Mythology," in 3 vols. 4to. *passim*.

CUSHAI, in *Geography*, a small river of America, which discharges itself into Albemarle sound, between Chowan and the Roanoke, in N. Carolina.

CUSHENDEN BAY, a small bay on the east coast of

the county of Antrim, Ireland, where there is pretty good anchorage when the wind does not blow on shore. Long. 5° 23' W. Lat. 55° 7' N.

CUSHETUNK MOUNTAINS, mountains of America, in Hynterton county, New Jersey.

CUSHING, a township of America, in Lincoln county, Maine, separated from Warren and Thomallow by St. George's river, incorporated in 1789, containing 1415 inhabitants, and lying 216 miles E by N. of Boston. The E. part of this township is now "St. George's," 35 miles S. E. of Wiscasset.

CUSHION, LADIES, in *Botany*. See SAXIFRAGA *hypnoides*.

CUSHION, SEA. See STATICE.

CUSHION, a rubber, in *Electricity*. See ELECTRICAL machine.

CUSHION, in *Engraving*, is a bag of leather filled with sand, commonly about nine inches square, and three or four thick, used for supporting the plate to be engraved.

CUSHION, in *Gilding*, is made of leather, fastened to a square board, from fourteen inches square to ten, with a handle. The vacancy between the leather and board is stuffed with fine tow or wool, so that the outer surface may be flat and even. It is used for receiving the leaves of gold from the paper, in order to its being cut into proper size and figures.

CUSI, in *Ancient Geography*, a town of Lower Pannonia, 16 miles from Bononia, according to the Itinerary of Antonine, supposed to be the present Cudelaf.

CUSI, in *Ornithology*, a name given by the people of the Philippine islands to a very small and very beautiful species of parrot.

CUSIGHE, SIMONE DA, in *Biography*, so called from the place of his nativity, a small town near Cadore, in the Venetian state, a painter who flourished in the 14th century. Some of his madonnas of considerable merit are still to be seen at Cusighe, and bear date from 1382 to 1409. Lauzi. Stor. Pitt.

CUSP, CUSPIS, properly denotes the point of a spear, or sword; but is used in astronomy to express the points, or horns of the moon, or any other luminary.

CUSP, in *Astrology*, is used for the first point of each of the twelve houses, in a figure, or scheme, of the heavens. See HOUSE.

CUSP of a Curve, in *Geometry*. See CURVE.

CUSPIDATED, in *Botany*, is when the leaves of a flower end in a cusp, or point, resembling that of a spear.

CUSPIDATED hyperbola, &c. See CURVE.

CUSPIDATUS DENS, in *Anatomy*, the canine tooth of the human subject. Mr. Hunter assigns the former name to it.

CUSPIDIA, in *Botany*, Gært. See GORTERIA *cernua*.

CUSSAC, in *Geography*, a small town of France, in the department of the Upper Vienne, six miles S. of Roche Chouart.

CUSSÆIM, in *Ancient Geography*. See COSSÆI.

CUSSAMBIUM, in *Botany*; Lam. Encyc. Rumph. amb. 1. 154. tab. 57. A tree hitherto but little known, which seems to have some affinity with the ponga of Rheede, and the tataiba of Piso, but differs in having a one-seeded drupe for its fruit; it is rather lofty, but not very spreading; its wood hard and heavy; the bark brown, rugged, and very brittle. Leaves generally opposite, oval-lanceolate, entire, on short petioles. Flowers small, in slender lateral racemes. Fruit roundish or egg-shaped, commonly rough, with pointed caducous tubercles; flesh rather thin, of a pleasant acid taste; kernel of the nut white, tender, oily.

A native

A native of the Molucca islands. The ripe fruit is eaten raw. A yellowish oil is expressed from the kernels, which having a pleasant smell, and not growing rancid, is used for lamps, and as an ingredient in various odoriferous preparations.

CUSSENS, in *Geography*, a small river of America, in Cumberland county, Maine, which runs a S.E. course to Casco bay, between the towns of Frankfort and North Yarmouth.

CUSSET, in Latin *Cussetum*, a town of France, in the department of the Allier, 21 miles N. of Roanne, and 255 S.E. of Paris. It is the chief place of a canton, in the district of La Palisse, with a population of 3945 individuals. The canton has 12 communes, and 14,443 inhabitants, upon a territorial extent of 180 kilometres.

CUSSIE, a town of Egypt, 15 miles S. of Ashmunein.

CUSSITAH, an Indian town, in the western part of Georgia, 12 miles above the broken Arrow, on Cattaheooc river.

CUSSONIA, in *Botany*, (named by the younger Linnaeus in honour of M. Cusson of Montpellier, a botanist who paid particular attention to the family of umbelliferous plants) Linn. jun. Supp. 1378. Schreb. 455. Willd. 517. Juss. 218. Class and order, *pentandria digynia*. Nat. Ord. *Aralia*; Juss.

Gen. Ch. *Cal.* Perianth five-toothed, permanent, superior, formed by the dilatation of the edge of the receptacle. *Cor.* Petals five, trigonous, acute, sessile. *Stam.* Filaments five. *Pist.* Germ inferior, top-shaped; styles two; stigmas simple. *Peric.* two-celled or two-coccos, two-valved, roundish, angular, crowned with the styles. *Seeds* one in each cell.

Fl. Ch. Petals five, trigonous. Calyx formed by the dilatation of the edge of the receptacle, five-toothed.

Sp. 1. *C. thyriflora*. Linn. jun. 1. Mart. 1. Lam. 1. Willd. 1. Thunb. Aët. Nov. Upsal. 3. tab. 12. "Leaves digitate; leaflets sessile, ridge-shaped, truncated, three-toothed; flowers in racemes." A shrub. *Stem* scabrous towards the bottom, unequal, simple, the thickness of a finger. *Leaves* on the upper part of the stem, near together, alternate, petioled; leaflets scarcely emarginate, sometimes, but rarely five-toothed; teeth remote, small; petioles long; stipules intrafoliaceous. *Flowers* in terminal cylindrical racemes, forming an umbel; rays four, quite simple, naked towards the bottom, bearing racemed flowers towards the top. There is a variety with jointed leaflets, the lowest joint dilated at the end into smaller lobes, so as to appear proliferous. 2. *C. spicata*. Linn. jun. 2. Mart. 2. Lam. 2. Illus. Pl. 187. Willd. 2. Thunb. Aët. Nov. Upsal. 3. tab. 13. "Leaves digitate in fevens; leaflets somewhat pedicelled, simple, and lanceolate, or ternate; flowers spiked." Whole plant smooth. *Flowers* in a single terminal spike about two inches long. Both species are natives of the Cape of Good Hope. Jussieu observes that this genus is scarcely distinct from panax; but that, if kept separate, the shrubby species of panax should be removed to it with *P. undulata* of Aublet, *unjala* of Rheede and perhaps *aralia umbellifera* of La Marck.

CUSTARD APPLE. See ANNONA.

CUSTINES, ADAM PHILIP DE, in *Biography*, one of the French generals in the revolutionary wars, was born at Metz, on the 4th of February 1740 of a noble family, and served in the seven years' war against Prussia. Having obtained the command of a regiment of dragoons, he exchanged this regiment against another which was ordered to America, and fought for American independence. On his

return to France, he was promoted to the rank of *maréchal de camp* (major general). In 1789, the nobles of Metz named him one of their deputies at the first national assembly, where he embraced the popular party, and moved the issuing of the assignats, (paper money) the dismissal of the ministers, and the abolition of the military establishments of the French princes.

In 1792 Custines was appointed commander in chief of the troops collected in the camp of Soissons, and afterwards of the army of the Rhine. He took possession of Spire, Mentz, and Frankfort on the Mayne; but a furious and impolitic proclamation against the princes of Germany made them unite their forces to oppose him. He was driven from Frankfort by the Prussians, from Worms by the Austrians, and obliged to retreat into Alsace.

Denounced by the jacobins as a traitor, he appeared at the bar of the convention to defend himself, but was condemned and executed on the 27th of August 1793. He went weeping to the scaffold, and died with cowardice. His son, who had been appointed French minister at Berlin, and whom the king of Prussia would not receive, showed much more firmness when, at the age of 25, he suffered death in January 1794, for having been a bad jacobin.

The military talents of general Custines were never held in great estimation; the soldiers under his command detested him for his pride and stern severity. *Nouv. Dict. Historique.*

CUSTODE. Fr. A holster cap. See CHAPERON.

CUSTODE *admittendo*, and *CUSTODE amovendo*, in *Law*, are writs for the admitting, or removing, of guardians.

CUSTODES *libertatis Anglie auctoritate parlamenti*, was the style, or title, in which writs, and other judicial proceedings, did run in the time from the death of Charles I. till Oliver was declared protector, &c. Stat. 12 Car. II. c. 3.

CUSTODIA. See RECTO *de custodia terre et hereditis.*

Hærede deliberando alii qui habet CUSTODIAM terre. See HÆREDE.

CUSTODIA *militaris*, Lat.; a military guard. Military prisoners at Rome, and in the provinces, were guarded in the following manner, particularly if guilty of serious offences or crimes. The guilty person had a chain fastened to his right hand, and to this chain was equally fastened the left hand of him who guarded him. Sometimes, for greater security, the criminal was confined under the guard of two persons tied with him. The chain was long enough for both the guards and the criminal to walk freely. This sort of confinement, however, which must have been attended with much inconvenience and have withdrawn from useful and more important duty a great number of soldiers, did not exist at all periods of the Roman government.

CUSTODIO, HIERONYMUS, in *Biography*, a painter born in Antwerp, who resided in England in the reign of queen Elizabeth. There is at Wooburn (the seat of the duke of Bedford) a portrait of Elizabeth Bruges, daughter of lord Chandos, with the following inscription, *Hieronymus Custodio Antverpiensis, fecit 1589.* Walpole.

CUSTODY of IDIOTS and LUNATICS, used formerly to be committed by the king himself to proper committees, in every particular case; but now, to avoid solicitations and the very shadow of undue partiality, a warrant is issued by the king under his royal sign manual to the chancellor or keeper of his seal, to perform this office for him; and if he acts improperly in granting such custodies, the complaint must be made to the king himself in council. (3 P. Wms. 108. Reg. Br. 267.) But the previous proceedings on the commission are on the law side of the court of chancery, and can only be redressed (if erroneous) by writ of error in

the regular course of law. See IDIOT, LUNATIC, and MAD-HOUSE.

CUSTODY of the *temporalities of bishops*, or of all the lay revenues, lands, and tenements (in which is included his barony), which belong to an archbishop's or bishop's see, forms the first branch of the king's ordinary revenues. Upon the vacancy of the bishopric, these are immediately the right of the king, as a consequence of his prerogative in church matters; by which he is considered as the founder of all archbishoprics and bishoprics, to whom during the vacancy they revert. The policy of the law hath vested this custody in the king, partly because before the dissolution of abbeys, he had the custody of the temporalities of all such abbeys and priories as were of royal foundation, on the death of the abbot or prior, and partly because, as the successor is not known, the lands and possessions of the see would be liable to spoil and devastation, if no one had a property in them. The law, therefore, has given to the king, not the temporalities themselves, but the custody of them till such time as a successor is appointed; with power of taking to himself all the intermediate profits, without any account to the successor; and with the right of presenting (frequently exercised by the crown) to such benefices and other preferments as fall within the time of vacation (stat. 17 Edw. II. c. 14. F. N. B. 32.) This revenue could not formerly be granted out to a subject; but now by stat. 15 Edw. III. ff. 4. c. 4 and 5, the king may, after the vacancy, leave the temporalities to the dean and chapter; saving to himself all advowsons, glebes, and the like. For the prevention and remedy of irregularities which anciently occurred with regard to these temporalities, it was one article of the great charter (9 Hen. III. c. 5.) that no waste should be committed in them, nor the custody of them be sold. The same is ordained by the statute of Westminster, 3 Edw. I. c. 21; and also 14 Edw. III. ff. 4. c. 4. The statute 1 Edw. III. ff. 2. c. 2. guards against the king's seizing the temporalities of bishops, during their own lives. This revenue, formerly considerable, is now reduced almost to nothing: for, at present, as soon as the new bishop is consecrated and confirmed, he usually receives the restitution of his temporalities quite entire, and untouched, from the king; and at the same time does homage to his sovereign; and then, and not sooner, he has a fee simple in his bishopric, and may maintain an action for the profits. Co. Litt. 67. 341.

CUSTOM is used to denote the manners, ceremonies, or ways of living of a people, which in time have turned into habit, and by usage obtained the force of laws.

In this sense, custom implies things that were at first voluntary, but are become necessary by use.

CUSTOM. *Consuetudo*, in *Law*, is a law not written, established by long usage, and the consent of our ancestors. No law can oblige a people without their consent; so wherever they consent, and use a certain rule or method as a law, such rule, &c. gives it the power of a law; and if it is universal, then it is common law; if particular to this or that place, then it is *custom*. 3 Salk. 112. And as to the rise of customs, when a reasonable act once done, was found to be good, and beneficial to the people, then they used it often; and by frequent repetitions of the act, it became a custom; which being continued without interruption time out of mind, it obtained the force of a law, to bind the particular places, persons, and things concerned therein. Thus a custom had beginning, and grew to perfection; and a good custom must be grounded on antiquity, continuance, peaceable acquiescence, reason, certainty, and mutual consistency.

As to the antiquity of any custom, it must have been

used so long, that the memory of man runneth not to the contrary; so that if any one can shew the beginning of it, it is no good custom. On this account no custom can prevail against an express act of parliament; since the statute itself is a proof of a time when such a custom did not subsist. Co. Litt. 113. As to *continuance*, any interruption would cause a temporary ceasing; and the revival gives it a new beginning, which will be within time of memory, and thus the custom will be void. But we must distinguish between an interruption of the *right*, and an interruption merely of *possession*, which, though it takes place for 10 or 20 years, will not destroy the custom. (Co. Litt. ibid.) *Peaceable acquiescence* is such as has not been subject to contention and dispute: for as customs owe their original to common consent, their being immediately disputed, either at law or otherwise, is a proof that such consent was wanting. Moreover, customs must be *reasonable*; or rather, taken negatively, they must not be unreasonable. This Sir Edward Coke explains (1 Inst. 62.) as referring to artificial or legal reason, warranted by authority of law; on which account a custom may be good, though the particular reason of it cannot be assigned; for it is sufficient, if no good legal reason can be assigned against it. With reference to the *certainty* of custom, it is observed, that a custom, limiting the descent of lands to the most worthy of the owner's blood, is void; for how shall it be determined? but a custom to descend to the next male of the blood exclusive of females, is certain, and therefore good. (1 Rol. Abr. 565.) A custom to pay a year's improved value for a fine on a copyhold estate is good, though the value is uncertain; for the value may at any time be ascertained: and the maxim of law is, "id certum est, quod certum reddi potest." Again, customs, established by consent, must be, when established, *compulsory*, and not left optional. Customs must be *consistent* with each other; one custom cannot be set up in opposition to another. For if both are really customs, then both are of equal antiquity, and both established by mutual consent; which it would be absurd to say of contradictory customs.

If it be asked, how are those customs and maxims which lie at the foundation of common law to be known, and how is their validity to be determined? The answer is, by the judges in the several courts of justice. They are the depositories of the laws, the living oracles, who must decide in all cases of doubt, and who are bound by an oath to decide according to the laws of the land. Such judicial decisions are the principal, and most authoritative evidence, that can be given, of the existence of such a custom as shall form a part of the common law. These are registered and preserved under the name of *records*, explained in our *reports*, and digested for use in the authoritative writings of the venerable sages of the law. See RECORDS and REPORTS, and AUTHORITIES.

The effect of a custom thus circumstantiated, is, that in popular states, and limited monarchies, it serves to interpret the written laws: for, in absolute monarchies, it is the king alone who has the power of interpreting laws. Hence, the word custom is still retained, and serves to express the particular rights, and municipal laws, established by usage in particular provinces, &c. after they are reduced into written laws.

In this sense, most of the common law of England is *lex non scripta*; being originally no more than the customs of our forefathers.

The Romans were governed by customs, or unwritten laws, after the expulsion of their kings.

Lex non scripta, in this sense, is used in opposition to statutes,

statutes, or acts of parliament; which commence laws at once. See COMMON LAW.

Another branch of the *lex non scripta*, or the unwritten laws of England, consists of particular customs, or laws which affect only the inhabitants of particular districts. These, or some of them at least, are undoubtedly the remains of that multitude of local customs, out of which the common law, as it now stands, was collected at first by king Alfred, and afterwards by king Edgar, and Edward the Confessor; each district mutually sacrificing some of its own special usages, in order that the whole kingdom might enjoy the benefit of one uniform and universal system of laws. But, for reasons that have been now long forgotten, particular counties, cities, towns, manors, and lordships, were, at a very early period, indulged with the privilege of abiding by their own customs, in contradistinction to the rest of the nation at large; which privilege is confirmed to them by several acts of parliament. Magn. Chart. 9 Hen. III. c. 9. 1 Edw. III. st. 2. c. 9. 14 Edw. III. st. 1. c. 2. 2 Hen. IV. c. 1. See BOROUGH-ENGLISH, GAVEL-KIND, DOWER, &c.

As to the *allowance* of special customs, it is observed, that customs, in derogation of the common law, must be construed strictly. Thus, by the custom of gavel-kind, an infant of 15 years may, by one species of conveyance, (called a deed of feoffment) convey away his lands in fee-simple, or for ever. Yet, this custom does not empower him to use any other conveyance, or even to lease them for seven years; for the custom must be strictly pursued. (Co. Cop. § 33.) And, moreover, all special customs must submit to the king's prerogative. Therefore, if the king purchases lands of the nature of gavel-kind, where all the sons inherit equally; yet upon the king's demise, his eldest son shall succeed to these lands alone. (Co. Litt. 15.) As general customs are determined by the judges, *particular* customs, such as are used in some certain town, borough, city, &c. shall be determined by a jury. (1 Inst. 110.)

For the difference between custom and prescription, see PRESCRIPTION.

CUSTOM of London. The principal local customs of this city are the following: if a citizen and freeman dies, leaving a widow and children, his goods and chattels, (deducting for the widow her apparel, and the furniture of her bed-chamber, called the "widow's chamber,") shall be divided into three parts; the widow shall have one part, the executor or administrator another, to discharge legacies, &c. and the children the other third part. If he leaves only a widow, or only children, they shall respectively, in either case, take one moiety, and the administrator the other. (2 P. Wms. 341. Salk. 246.) If he leaves neither widow nor child, the administrator shall have the whole. (1 Show. 175.) This portion, or "dead man's" part, the administrator was wont to apply to his own use, (2 Freem. 85. 1 Vern. 133.) till the statute 1 Jac. II. c. 17. declared that the same should be subject to the statute of distribution. So that if a man dies worth 1800*l.* personal estate, leaving a widow and two children, this estate shall be divided into 18 parts; of which the widow shall have eight, six by the custom and two by the statute, and each of the children five, three by the custom and two by the statute:—if he leaves a widow and one child, she shall still have eight parts, as before; and the child shall have ten, six by the custom and four by the statute:—if he leaves a widow and no child, the widow shall have three-fourths of the whole, two by the custom and one by the statute; and the remaining fourth shall go, by the statute, to the next of kin. It is also to be observed, that if the wife be provided for by a jointure before mar-

riage, in bar of her customary part, it puts her in a state of non-entity, with regard to the custom only (2 Vern. 665. 3 P. Wms. 16.); but she shall be entitled to her share of the "dead man's" part under the statute of distributions, unless barred by special agreement. (1 Vern. 15. 2 Chan. Rep. 252.) And if any of the children are advanced by the father in his life-time with any sum of money, (not amounting to their full proportionable part,) they shall bring that portion into hotchpot with the rest of the brothers and sisters, but not with the widow, before they are entitled to any benefit under the custom. (2 Freem. 279. 1 Equ. Caf. Abr. 155. 2 P. Wms. 526.); but, if they are fully advanced, the custom entitles them to no further dividend. The custom of London extends also to the province of York, and also to the kingdom of Scotland, and probably also to Wales; inasmuch, that the effects of the intestate, after payment of his debts, are, in general, divided according to the ancient universal doctrine of the *pars rationabilis*, in the manner above stated. However, in order to favour the power of bequeathing, and to reduce the whole kingdom to the same standard, three statutes have been provided; the one 4 and 5 W. & M. c. 2, explained by 2 and 3 Ann. c. 5, for the province of York; another, 7 and 8 W. III. c. 38, for Wales; and a third, 11 Geo. I. c. 18, for London;—by which it is enacted, that persons within those districts, and liable to these customs, may (if they think proper) dispose of *all* their personal estates by will; and the claims of the widow, children, and other relations, to the contrary, are totally barred. There are two principal points, besides other less material variations, in which the customs of London and of York considerably differ. One is, that in London the share of the children (or orphanage part) is not fully vested in them till the age of twenty-one, before which they cannot dispose of it by testament (2 Vern. 558.); and if they die under that age, whether sole or married, their share shall survive to the other children; but after the age of twenty-one, it is free from any orphanage custom, and in case of intestacy, shall fall under the statute of distributions. (Prec. Chanc. 537.) The other is, that in the province of York, the heir at common law, who inherits any land either in fee or in tail, is excluded from any filial portion or reasonable part. (2 Burn. 754.) But, notwithstanding these provincial variations, the customs appear to be substantially one and the same.

A woman in London that uses a trade, without her husband, is chargeable without him, as a *feme sole* merchant; and if condemned may be put in prison till she pay the debt; and her bail are liable, if she absents herself, and the husband shall not be charged. It is the custom of the city of London, that a person educated in one trade may set up in another. See APPRENTICE. A person may acquire the freedom of London either by the servitude of an apprenticeship, by birth-right, as the son of a freeman, or by purchase, under an order of the court of aldermen. (1 Mod. 145.) In London every day, except Sunday, is a market overt, for the buying and selling of goods and merchandise. (5 Rep. 85.) But no person, not being a freeman of London, shall keep any shop, or other place to put to sale by retail any goods or wares, or use any handicraft trade for hire, gain, or sale, within the city, upon pain of forfeiting 5*l.* (8 Rep. 124. Chart. Car. I.)

If a debtor be a fugitive, he may be arrested before the day to find better security. See FOREIGN ATTACHMENT. Every tenant at will of a house above 40*s.* *per ann.* in the city, ought to give and receive half a year's warning on leaving it. An arrest may be made in London, on the plaintiff's entering his plaint in either of the compters, and a serjeant of London need not shew his mace when he arrests a person;

and the liberties extend to the suburbs and Temple-Bar. Jenk. Cent. 201.

If the existence of any custom in London be questioned, it shall not be tried by a jury, but by a certificate from the lord mayor and aldermen by the mouth of their recorder (Cro. Car. 516.); unless it be such a custom as the corporation itself is interested in, as a right of taking toll, &c.; for then the law permits them not to certify on their own behalf; but it must be determined by a jury (Hob. 85.) It is said (1 Ro. Rep. 106.) that the courts at Westminster take notice of the customs of London, and not of any other place. But this is only where they have been certified. The customs of London are confirmed by act of parliament. 8 Rep. 126. Cro. Car. 347.

CUSTOM of Merchants. lex mercatoria, a particular system of customs used only among one set of the king's subjects; which, however different from the general rules of the common law, is yet ingrafted into it, and made a part of it (Winch. 24.); being allowed, for the benefit of trade, to be of the utmost validity in all commercial transactions; for it is a maxim of law, that "*Cuilibet in sua arte credendum est.*" This custom of merchants is so far considered as law, that it affords the rule of construction, in cases of contracts, agreements, &c. and other commercial transactions. The *lex mercatoria*, like the *lex et consuetudo parliamenti*, describes only a great division of the laws of England. The laws relating to bills of exchange, insurance, and all mercantile contracts, are as much the general law of the land, as the laws relating to marriage or murder. And it is the opinion of Mr. Justice Foster, that the custom of merchants is the general law of the kingdom, and, therefore, ought not to be left to a jury after it has been settled by judicial determinations. 2 Barr. 1226.

CUSTOM, Assurances by. See COMMON ASSURANCES.

CUSTOM, Dover by. See DOWLER.

CUSTOM-Heriot. See HERIOT.

CUSTOM-Suit. See SUIT.

CUSTOMS, in *Commercium*, the duties, tolls, or taxes, paid upon merchandize when brought into or carried out of a country. They appear to have been called customs, as denoting customary payments, which had been in use from time immemorial; and began to be imposed as soon as commerce became an object of public attention. Such princes as wished to encourage foreign trade, found that it brought some additional expences upon them, as it became necessary to maintain ambassadors or other public agents in most of the countries to which their subjects resorted; to negotiate treaties for the regulation of commercial intercourse; to establish courts for deciding maritime causes; and to maintain a navy for protecting merchant vessels at sea from enemies and pirates. In order to indemnify themselves for these charges, they demanded of the merchants tolls, tributes, or customs, by authority of the royal prerogative, which continuing to be paid as customary dues, came to be considered as part of the inheritance of the crown. The considerations (says judge Blackstone) upon which this branch of the revenue (or the more ancient part of it, which arose only from exports) was invested in the king, were said to be two (Dyer. 165): 1. Because he gave the subject leave to depart the kingdom, and to carry his goods along with him. 2. Because the king was bound of common right to maintain and keep up the ports and havens, and to protect the merchant from the pirates.

The ancient customs in England, consisted of small sums paid by the merchants for the use of the king's warehouses, weights, and measures. About the year 979, king

Ethelred established duties on ships and merchandize, to be paid at Billingsgate in the port of London. In Magna Charta it was stipulated that merchants were to come into the kingdom to buy and sell *per antiquas consuetudines*, which proves that some customs had been usually paid long before that time. And some have imagined, that they are called with us customs, because they were the inheritance of the king by immemorial usage, and the common law, and not granted him by any statute (Dyer, 43. pl. 44); but sir Edward Coke hath clearly shewn (2 Inst. 58, 59.), says judge Blackstone, that the king's first claim to them was by grant of parliament (3 Edw. I. A.D. 1274), though the record thereof is not now extant. And indeed this is in express words confirmed by statute 25 Edw. I. c. 7. A.D. 1297, wherein the king promises to take no customs from merchants, without the common assent of the realm, "saving to us and our heirs, the customs on wool, skin, and leather, formerly granted to us by the commonalty aforesaid." These were formerly called the hereditary customs of the crown; and were due on the exportation of the said three commodities, and of none other; which were styled the "staple" commodities of the kingdom, because they were obliged to be brought to those ports where the king's staple was established, in order to be there first rated, and then exported. These customs, granted by the act of 3 Edw. I. consisted of a duty of six shillings and eight-pence for every sack of wool, containing twenty-six stone; six shillings and eight-pence for every three hundred woolfells; and thirteen shillings and four-pence for every last of hides; a last containing twelve dozen. These duties, with some others of inferior importance which were then levied, were afterwards denominated *custuma antiqua sive magna*. They were payable by every merchant, as well native as stranger: with this difference, that merchant-strangers paid an additional toll, *viz.* half as much again as was paid by natives. The appellation *custuma* seems to be derived from the French word *coustum*, or *coitum*, which signifies toll or tribute, and owes its own etymology to the word *coust*, denoting price, charge, &c. as we have adopted it in English, *cost*. By an ordinance of 31 Edw. I. certain new duties of customs were established, to be paid by alien merchants only; these were called *custuma nova* or *custuma parva*, and aliens' duty, and consisted of an additional duty of two shillings for every hoghead of wine imported; additional duties of forty pence for every sack of wool; six shillings and eight-pence for every last of hides, and forty pence for every three hundred woolfells, exported; two shillings for every piece of cloth dyed in grain; eighteen pence for every piece of cloth, in which part of a grain colour was intermixed; and twelve pence for every other cloth without grain; twelve pence for every quintal of wax; and three-pence in the pound on all other kinds of merchandize. The duty on wine, which was at first called *butlerage*, because paid to the king's butler, exchanged for *prifage*, or a right of taking two tons of wine from every ship importing into England twenty tons or more, being afterwards imposed at so much a ton, was called a *tonnage*; and the duty on goods not specified being imposed at so much in the pound of their estimated value, was called a *poundage*. In the 47th year of Edward III. a duty of sixpence in the pound was imposed upon all goods exported and imported, except wool, woolfells, leather, and wines, which were subject to particular duties. In the 14th of Richard II. this duty was raised to one shilling in the pound; but three years afterwards, it was again reduced to sixpence. It was raised to eight-pence in the 2d year of Henry IV.; and in the fourth year

year of the same price to one shilling. From this time, to the 9th year of William III., this duty of poundage continued at one shilling in the pound. The duties of tonnage and poundage were generally granted by one and the same act of parliament, and were called the subsidy of tonnage and poundage. These duties were at first granted, as the old statutes (and particularly 1 Eliz. c. 19.) express it, for the defence of the realm, and the keeping and safeguard of the seas, and for the intercourse of merchandize safely to come into and pass out of the same. They were at first granted only for a fixed term of years, as for two years in 5 Rich. II.; but in the time of Henry VI. they were granted him for life by a statute in the 31st year of his reign; and again to Edward IV. for the term of his life only;—since which time they were regularly granted to all his successors for life, sometimes at the first, sometimes at other subsequent parliaments, till the reign of Charles I.; when, as lord Clarendon expresses it (Hist. Rebell. b. iii.) his ministers were not sufficiently solicitous for a renewal of this legal grant. And yet these imposts were imprudently and unconstitutionally levied and taken, without consent of parliament, for fifteen years together; which was one cause of the subsequent troubles. However, the king, previous to the commencement of hostilities, passed an act, with a view of correcting past errors and appeasing prevalent discontents, by which he renounced all power in the crown of levying the duty of tonnage and poundage, without the express consent of parliament; and also all power of imposition upon any merchandizes whatever. Upon the restoration this duty was granted to king Charles II. for life, and also to his two immediate successors; and by three several statutes, 9 Ann. c. 6, 1 Geo. I. c. 12, 3 Geo. I. c. 7, it was made perpetual, and mortgaged for the debt of the public.

The subsidy of poundage having continued for so long a time at one shilling in the pound, or at five per cent., a subsidy came, in the language of finance, to denote a general duty of this kind of five per cent. This subsidy was afterwards called the old subsidy, and was levied according to a book of rates established in the 12th year of Charles II. The new subsidy imposed by the 9th and 10th William III., was an additional five per cent. upon the greater part of goods. The one-third and the two-thirds subsidy, made up together another five per cent. of which they were proportionable parts. The subsidy of 1747, made a fourth five per cent. upon the greater part of goods; and that of 1759, a fifth upon some particular sorts of goods. The old subsidy was imposed indifferently, upon exportation as well as importation; but the four subsequent subsidies, as well as most of the duties which have since been occasionally imposed on a great variety of goods, have been laid almost wholly upon importation: other ancient duties which had been imposed on the exportation of the produce or manufactures of the country, have either been reduced or taken off altogether. The customs thus imposed by parliament were, till the stat. 27 Geo. III. c. 13, contained in two books of rates, set forth by parliamentary authority, stat. 12 Car. II. c. 4, 11 Geo. I. c. 7. One of these was signed by sir Harbottle Grimston, speaker of the house of commons in the time of Charles II.; and the other, an additional one signed by sir Spencer Compton, speaker in the reign of George I., to which also subsequent additions have been made.

The book of rates, established in 1660, has been considered as the foundation of the present mode of levying

the duties of customs, as it contained the rate of duty payable both by denizens and aliens, and the value to be set upon different descriptions of merchandize, and specified the articles which were custom free. Some new duties on importation were afterwards imposed, and at the revolution the duties of customs consisted of the following branches.

1. Tonnage and poundage granted to Charles II. for life, and to James II. for his life; which, by an account laid before parliament in the first session after the revolution, produced on a medium of four years, 577,507*l.* 12*s.* 10½*d.*; but, according to Dr. Davenant, it produced 600,000*l.* clear of all charges and deductions.
2. Duties on wines and vinegar imported, granted in 1685, which by the same account produced 172,900*l.* 11*s.* 8½*d.*
3. Duties on tobacco and sugar imported, likewise granted in 1685, and which by the same account produced 148,861*l.* 8*s.* per annum.
4. Duties on the importation of French linens, wrought silks, brandies, and East India manufactures, which were also established in the same year, and produced 93,710*l.* 8*s.* 1*d.* per annum.

The total produce of the customs in 1688 was therefore about 992,980*l.*, being more than double their amount twenty years prior to that period.

A considerable increase in the public expenditure, with the introduction of the funding system, occasioned very frequent impositions of new duties, which were generally adjusted on the principles of the old subsidy; that is, the value of the goods was ascertained by a book of rates, and the amount computed by the quantities of the goods, either with respect to gauge, to weight, or to tale; the duty was, therefore, not a certain proportion of their real value, but of an arbitrary value, agreeing, perhaps, with the current value at the time of imposing the duty; but which must, from the natural fluctuations of trade and manufactures, be necessarily liable to many changes and alterations. The consequence of this mode of fixing duties was, that when they were laid on by bulk on goods of one general description, the duty was always the same, whether upon the finer or the coarser manufacture; by which means it either operated as a prohibition to the latter, or was not at all felt by the former. There was also another mode by which duties were imposed; this was by a proportion to the value on goods not rated, being the real and actual value of the same as sworn to by the importer. These principles of taxation, being once adopted, were pursued in all the new and additional duties of customs which were imposed for payment of the interest on the various loans which were raised from time to time for the public service. In some instances the additional duties were calculated by a percentage on the duties previously paid; in others a further duty was laid on a different denomination of the commodity, either with respect to its value, its bulk, its weight, or its number; and by proceeding gradually in this manner, from period to period, the numerous additions made had at length become such a mass of confusion as produced an infinity of inconvenience and delay in business, and became the subject of universal complaint among mercantile persons. The perplexity arose in a great degree from almost all the additional duties having been appropriated to some specific fund, for the payment of certain specific annuities, in consequence of which it was necessary that a separate calculation should be made at the custom-house for each of the different duties. From the great complexity of the whole of this branch of the revenue, scarcely any one merchant could be acquainted by any calculations of his own, with the exact amount of what he was to pay; nor could much assistance in this respect be derived from the va-

rious books which had been published for the purpose of furnishing a general view of the customs, as in every session of parliament some alteration or another was made in several of the duties, and each of these alterations, following the old principle, totally unlinged and overturned the use of every preceding printed calculation; the officers of the customs, therefore, who from constant practice had acquired some facility in making the necessary calculations, were the only persons to whom the merchants could apply for assistance and direction: thus the merchant was not only in a great degree left at the mercy of the officers, but the officers themselves, who were intended to be a check upon the merchants, were forced to become their agents.

In order to remedy these inconveniences, Mr. Pitt proposed, in the beginning of the year 1787, to abolish all the duties then subsisting, and to substitute in their stead one single duty on each article, amounting as nearly as possible to the aggregate of all the various duties then payable; only in general where a fraction was found in any of the sums, to charge the nearest integral number, usually taking the higher rather than the lower, which made a small addition to the revenue. The series of resolutions submitted to the house of commons, for the purpose of carrying this measure into effect, but of which the house chose to waive the formality of reading, amounted to upwards of three thousand in number. A systematic simplicity and uniformity was at the same time introduced into the custom-house accounts, by which a more distinct view has been since obtained both of the total amount of this important branch of the revenue, and of the various sources from which it arises. These beneficial regulations were the result of the laborious investigation and judicious remarks of the commissioners of public accounts, who in their 13th, 14th, and 15th reports, had fully explained the constitution of this department, the duties of its several officers, and the mode of collecting the customs both in London and the out-ports. They also pointed out many other important regulations for the reduction of expence, or the accommodation of merchants, most of which have been since carried into effect. The statute 27 Geo. III. c. 13. called "the consolidation act," repeals all former statutes imposing duties of customs and excise, with regard to the *quantum* of the duty; and the two books of rates above-mentioned were declared to be of no avail for the future; but all the former duties were consolidated, and were ordered to be paid according to a new book of rates annexed to that statute.

Statement of the gross and nett Revenue of the Customs, with the Rate per Centum of the Expence of Collection.

Years.	Gross Receipt.	Rate per Cent. thereon.	Nett Produce.	Rate per Cent. thereon.
	£	£ s. d.		£
1789	5,417,333	6 7 0	4,050,003	8 9 10
1790	5,349,478	6 17 6	3,976,808	9 5 0
1791	5,587,853	7 3 8	4,193,817	9 11 6
1792	6,045,818	6 9 7	4,407,837	8 17 6
1793	5,574,708	6 19 7	4,221,832	9 4 8
1794	5,841,840	7 1 8	3,821,216	10 16 8
1795	5,776,058	6 19 5	3,959,462	10 3 5
1796	6,381,902	6 2 6	4,533,489	8 12 6

The total gross receipt accounted for, falls short of the whole sum raised upon the public in consequence of the duties constituting this branch of the revenue, as there are fees paid to the various officers, in part sanctioned by law, but chiefly claimed on the ground of ancient usage, which

are a very considerable charge to the merchant. In the year 1788, the opinions of the merchants resident in London, and in most of the out-ports, were collected, upon the expediency of abolishing or regulating these fees, and of providing compensations to the officers by a tonnage duty. The merchants of London declared their wishes for a total abolition; and the various communications received from the merchants and traders at the out-ports, rendered it evident that it would be impracticable to form a general table of fees to suit all places. With a view, therefore, to ascertain the amount of the fees for which it would be proper, that a compensation should be provided, if the fees themselves were abolished, an act was passed, authorizing the treasury to appoint two commissioners of the customs in England, and one in Scotland, to enquire on oath into the emoluments of all persons employed in the service of the customs. In January 1790, these commissioners, having visited thirty-four out-ports, made their first report, recommending certain measures for relief of the coasting-trade; and in the same year an act of parliament was passed for the relief of that trade, at a considerable loss to the revenue. In March 1791, the commissioners made a second report, by which it appeared that the total of the fees received, exclusive of allowances from the crown and shares of seizures, amounted, in the year 1788, to 133,805*l.* 6*s.* 3*d.* In May 1791, they made their third report; in which, after stating and discussing the various opinions communicated to them by the merchants, they declared themselves to be decidedly of opinion, that an entire abolition of custom-house fees, and the payment of every person in that department wholly by the crown, would be a measure highly beneficial both to the commerce and to the revenue of the country: and they further gave their opinion, that if an entire abolition was deemed inexpedient, great advantages might still accrue to commerce, and much security to the revenue, by abolishing the fees paid to the persons usually called out-door officers; the annual amount of which was about 45,000*l.*; and that this measure, though of a more limited extent, would place the out-door business at the several ports of the kingdom, on an equal footing. In consequence of these representations, a bill was prepared in 1792; but the apparent difficulty of the subject, and the expence of providing a compensation upon the principle and to the extent suggested, prevented any further proceedings upon the subject; thus a very laborious investigation was rendered of no benefit, and the mercantile interest is still burthened with this highly improper mode of remunerating the servants of government. It cannot be doubted that if fixed and nett salaries could be given to every officer of the customs, proportionate to his services, instead of leaving their compensation to depend upon having additional places or employments in other situations, it would contribute greatly to the independence of the officers, to the relief of the trader, and to the security of the revenue.

Any article of commerce liable to a custom duty upon importation, must, to secure the payment of the duty, be watched from the time the ship enters the port, until the duty is paid; and as it becomes forfeited by evading the duty, it may be pursued and seized. Any article liable to a duty upon exportation, must, to prevent its being changed or altered, be guarded from the time the duty is paid, until the ship has quitted the port: and an article entitled to a drawback or bounty upon exportation, must likewise, to prevent the re-landing of it, be guarded from the time the merchant delivers it to the officer, until the ship has quitted the port. Hence arises the necessity for different

C U S T O M.

different classes of officers, to attend upon and examine these articles, at different stages, in their passage between the ship and the merchant; and to pursue them if they escape the duty. The total number of officers, clerks, and assistants, employed in the management of this branch of the public revenue, was, in the year 1784, 1606, with an indefinite number of inferior attendants; since that period several useless offices have been suppressed, but the great increase in the duties has rendered it necessary to augment the number of persons employed in collecting them very considerably.

The laws relating to the customs are voluminous in bulk, and intricate in their details, comprehending not less than twelve hundred articles upon which duties are levied; about nine hundred of these are subject to rated duties, and the rest are charged *ad valorem*. The statutes relative to the customs alone fill six very large volumes in folio; they are unprovided with any printed index; and the compilation, even in this state, is not published, nor can it be commonly obtained by purchase. This circumstance induced the Committee on Finance, in 1797, to recommend strongly the consolidation and simplification of the laws of the customs, by which means the revenue officer would be enabled to execute his duty with more promptitude and safety; the merchant would better know how to transact his commercial concerns with the revenue; and the foreign trader would have the means of avoiding those errors which, at present, so frequently expose his property to seizure, for the omission of forms which it is almost impossible that he should know to be necessary. At some future period of peace this very useful measure will probably be accomplished.

In the year 1803, another consolidation of the duties was effected by 43 Geo. III. c. 68; but the new duties, which have been since imposed, have again destroyed, in some degree, the simplicity then established, and will render it necessary, at no great distance of time, to recur again to the same principle.

The extraordinary system of warfare adopted in the succeeding contest between France and Great Britain, in which unprecedented decrees were attempted to be enforced, for excluding the latter country from every species of commercial intercourse with other nations, rendered necessary some measures of retaliation; with this view, new duties on exportation, commencing from 5th February 1808, were imposed on all the principal articles of foreign merchandize, with the exception of the produce of the British colonies, and of articles which had been imported by the East India Company.

The total nett produce of the customs, after deducting re-payments, drawbacks, bounties, and the charges of management, has been as follows:

In 1802	£7,415,726	19s. 3 $\frac{3}{4}$ d.
1803	7,776,775	2 7 $\frac{3}{4}$
1804	9,060,297	8 2 $\frac{1}{2}$
1805	9,825,037	15 9 $\frac{3}{4}$
1806	10,553,293	19 9 $\frac{3}{4}$

Total Gross Receipt of the Customs of Great Britain, for the Year ending 5th January 1807.

Balance in the hands of the different collectors, on 5th January 1806	£50,843	16s. 3d.
Balance in the hands of the receiver-general of Scotland, on 5th January 1806		
1806	54,657	3 8 $\frac{1}{2}$
Carry over	£105,500	19 11 $\frac{1}{2}$

Brought over	£105,500	19 11 $\frac{1}{2}$
Bills arising and remitted out of the revenue of 1805, but not brought to account till 1806		
- - - - -	283,759	1 3 $\frac{3}{4}$
Gross receipt within the year, including permanent and annual duties, and war taxes		
- - - - -	12,379,983	19 1 $\frac{1}{4}$
Total	£12,769,244	0 4 $\frac{1}{2}$

The various payments to which this receipt was subject, including the nett payment into the exchequer, were as follow:

Drawbacks of duty on exportation	£162,119	11s. 0 $\frac{1}{4}$ d.
Repayments on over-entries and damaged goods	79,781	0 5 $\frac{1}{2}$
Bounties on exportation	1,318,446	0 2
Bounties for promoting national objects	307,864	3 1 $\frac{1}{4}$
Imprest money granted to out-port collectors, &c.	34,989	13 3
Paid towards the expenses of the civil government of Scotland	76,445	18 6 $\frac{5}{8}$
Charges of management	655,603	8 10 $\frac{1}{2}$
Payments into the exchequer, on permanent and annual duties, and war taxes	9,733,813	12 1 $\frac{1}{2}$
Balance in the hands of the different collectors, on the 5th January 1807	58,594	11 6 $\frac{1}{2}$
Balance in the hands of the receiver-general of Scotland, on the 5th January 1807	61,542	8 7 $\frac{1}{2}$
Bills arising and remitted out of the revenue of 1806, but not brought to account till 1807	280,043	12 7 $\frac{1}{2}$
Total	£12,769,244	0 4 $\frac{1}{2}$

Deducting from the gross receipt within the year, of 12,379,983*l.* 19*s.* 1 $\frac{1}{4}$ *d.*, the sums paid for drawbacks on exportation, and in bounties for promoting national objects, the total nett amount of the year's duties will be 11,910,000*l.* 4*s.* 11 $\frac{1}{4}$ *d.*, arising as follows:

From duties inwards	£10,166,561	13s. 4 $\frac{3}{4}$ d.
Duties outwards	621,566	16 5 $\frac{1}{4}$
Duties coastways	1,035,988	17 8
Remittances from the plantations	26,061	16 7 $\frac{3}{4}$
Quarantine tonnage duty	13,370	14 7
Condemned tobacco, rent of tobacco warehouses, &c.	17,570	5 11 $\frac{1}{2}$
Imprest money repaid	28,880	0 3
Total	£11,910,000	4 11 $\frac{1}{4}$

Total Gross Produce of the Customs of Ireland for the Year ending 5th January 1807.

From duties inwards	£1,889,462	15s. 5 $\frac{1}{2}$ d.
Duties outwards	20,129	11 9 $\frac{1}{2}$
Storage	1,951	10 11 $\frac{3}{4}$
Light money	6,114	8 1 $\frac{1}{2}$
Irish spirits	959	4 3
Fines and seizures, surecharges, &c.	16,923	7 2 $\frac{1}{2}$
Total	£1,920,359	16 4 $\frac{3}{4}$
Deduct appropriated duties	15,181	1 5
Total	£1,920,359	16 4 $\frac{3}{4}$

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The total expence of collecting the revenue of the customs, in the year above-stated, was, in England, at the rate of *5l. 1s. 3d. per cent.* on the gross receipt, or *6l. 1s. 3d. per cent.* on the nett produce; in Scotland it amounted to *5l. 17s. 7d. per cent.* on the gross receipt, or *7l. 18s. 4d. per cent.* on the nett produce. In Ireland the expences of this branch of the revenue being in a great measure blended with the excise, cannot be separately stated, but they considerably exceed the rate of collection in Great Britain.

The statutes for preventing frauds in this branch of the revenue, and for directing and regulating the conduct of merchants and of the several officers of the customs are much too numerous to be here recited. Some of the principal are as follow:

In case goods and merchandize are brought to a port, and part of the goods are sold there, but never landed, they must pay the customs. Ships outward bound, and coming from beyond sea, having goods and merchandize on board, are to be entered at the custom-house, and the customs paid or agreed for under the penalty of 100*l.* and forfeiture of the goods; one moiety to the king, and another to the seisor, &c. and if any concealed goods are found after clearing, for which the duties have not been paid, the master of the vessel shall be subject to the like penalty. 13 and 14 Car. II. c. 11. Officers of the customs may search ships; and having writ of assistance search houses. By other statutes, foreign goods, taken in at sea by any coasting vessel, shall be forfeited and treble value: and for prevention of clandestine running of goods, if any foreign brandy, &c. is imported in vessels under forty tons, the importer shall forfeit the vessel and brandy. Run goods concealed or offered for sale, are liable to forfeiture and treble value. 8 and 11 Geo. I. When three persons are assembled and armed with fire-arms, &c. to be assisting in running goods, they shall be adjudged guilty of felony: and 50*l.* be paid for apprehending such offenders, &c. And two or more found in company within five miles of the sea-coast, with any horses, carts, &c. on which are put above six pounds of tea, or five gallons of brandy, or other foreign goods of 30*l.* value, landed without entry, and not having permits, who shall carry any offensive weapons, &c. or assault any officer of the customs, shall be deemed runners of goods, treated as felons, and the goods shall be seized and forfeited. If any person offers any tea, brandy, &c. to sale, without a permit, the persons to whom it is offered may seize and carry it to the next warehouse belonging to the customs or excise, and be entitled to a third part of the produce on condemnation. And persons offering any bribe to officers of the customs to connive at the running of goods are liable to a forfeiture of 50*l.*; obstructing such officers in entering and searching ships, incurs a forfeiture of 100*l.*; and if the officers are wounded or beaten on board any ship, the offenders incur the penalty of transportation, &c. 9 Geo. II. If any persons, three or more, armed with weapons, shall be assembled in order to aid in the illegal exportation of goods to be exported, or the running of uncustomed goods, or the illegal relanding of any goods, or rescuing the same after seizure, or the person apprehended for a felonious act relating to the customs or excise, or preventing a guilty person from being apprehended; or if such persons shall so assist, or have their faces blacked, or wear a mask, or other disguise, when passing with such goods, forcibly obstruct or resist, any revenue officer in seizing such goods, or shall maim or dangerously wound, &c. such officer, in his attempt to go on board any vessel, or shoot at or dangerously wound any such person when

on board, and in the execution of his office; every such person shall be guilty of felony, and suffer death. On information on oath of any persons being guilty of any of the above offences, the justice may certify the information to one of the secretaries of state, who is to lay it before his majesty: and his majesty may order the offender to surrender himself in 40 days after publication of the order in the Gazette; and in default thereof the order being published twice in the Gazette, and proclaimed in two markets near the place where the offence was committed, and a copy of it being affixed in some public place there, the offender shall be attainted of felony, and suffer death. Any person harbouring or aiding any such offender after the expiration of the time of his surrender, knowing that he has been required to surrender, being prosecuted within a year, shall be transported for seven years. If any officer, &c. in the seizing, &c. of such goods, or the attempt for apprehending such offender, shall be lost, wounded, maimed, or killed, or the goods be rescued, the inhabitants of the hundred, &c., unless the offender be convicted within six months, shall forfeit 100*l.* to the executors of any officer killed, and pay damages to any officer beat, &c. not exceeding 40*l.*, and for any goods rescued, not exceeding 200*l.* A reward of 500*l.* for apprehending any offender, a person wounded in apprehending any offender to have 50*l.* extraordinary, and the executors of a person killed to have 100*l.* 19 Geo. II. c. 34.

By stat. 14 Ric. II. c. 10.; no customer or comptroller of the customs shall have any ships of his own, or meddle with the freight of ships. By stat. 10 Hen. VI. c. 5. no searcher, surveyor, &c. or their clerks &c. may have any such ships of their own; nor shall use merchandize, keep a wharf, inn, or tavern, or be factor, attorney, &c. to a merchant, under the penalty of 40*l.* By stat. 3 Hen. VI. c. 3.; customers, collectors, or comptrollers, shall not conceal customs duly entered and paid, on forfeiture of treble value, and payment of fine and ransom to the king. By stat. 13 and 14 Car. II. c. 11.; if any persons employed about the customs and subsidies take a bribe, or connive at any false entry, they shall forfeit 100*l.* and be incapable of any employment under the king: and the person who gives the bribe shall forfeit 50*l.* By stat. 5 Geo. I. c. 11.; if an officer of the revenue shall make any collusive seizure of foreign goods, to the intent that the same may escape payment of the duties he is to forfeit 500*l.* and be incapable of serving his majesty; and the importer and owner shall forfeit treble value of the goods so collusively seized. By stat. 12 Geo. I. c. 28; officers of the customs, &c. shall not trade in brandy, coffee, &c. on pain of 50*l.* and forfeiture of offices. For other particulars, see DRAWBACK, EXCISE, and SMUGGLING.

CUSTOMARY FREEHOLDERS, are a species of copyholders, of free or privileged tenure, who are derived from the ancient tenants in villein-socage, and are not said to hold "at the will of the lord," but only "according to the custom of the manor." These may be allowed, without absurdity, to be capable of enjoying a freehold interest; and therefore the law doth not suppose the freehold of such lands to rest in the lord of whom they are holden, but in the tenants themselves; who are sometimes called customary freeholders, being allowed to have a freehold *interest*, though not a freehold *tenure*. See COPYHOLD.

CUSTOMARY Land, in Agriculture, is that description of land which is granted by the lord of a manor to a tenant under certain restrictions, in respect to fines, quit rents, &c. according to the particular rules and regulations of the manor.

manor. The author of *Modern Agriculture* has remarked, that a considerable portion of the lands of this country are held under lords of manors by copyhold or customary tenures, subject to the payment of fines on the alienation of the property, the death of the lord or of the tenant, and also to the payment of certain yearly rents, and the performance of various services. That this sort of tenure, says he, should be considered not only as a grievance, but also as an obstacle to agricultural improvement, cannot appear surprising, when it is remarked that the lord of the manor is entitled to two years' improved value of the copyholds on the death of the copyhold tenant, or on the alienation of the property. Under such circumstances it is not probable that the possessors will be disposed to a liberal expenditure of money on the improvement of lands held by a tenure of this restricted kind. Besides, says he, the services performable by the proprietors of copyhold or customary lands, in the north-west of England in particular, are disgraceful in the extreme, and such as in a free country ought to be for ever abolished. They consist of cutting, drying, and loading the lords' peats, ploughing and harrowing his land, reaping his corn, making his hay, carrying his letters, &c. whenever and how often his lord's services are demanded. It could not, he supposes, be a matter of much difficulty to arrange general terms, on which copyholders might have it in their power to enfranchise the estates, by payment of a certain sum to the lords of manors for the total abolition of this remain of the feudal system. So far as he is informed, lords of manors may, as the law now stands, make any arbitrary demand they please on their vassals for the enfranchisement of their lands; and if not complied with, they must remain in the state above described. Whereas, were an equitable mode established, whereby the copyholder could purchase his independence on reasonable terms, few would continue, he thinks, in a state of bondage, nor would the improvement of the country be obstructed by the arbitrary exactions of the superiors and great landholders. As manorial rights have been handed down from father to son for many generations; and as by the law of the country, the present possessors have as good a title to exercise these rights as any of their predecessors, it would, he says, be unjust to deprive them of the privilege, without giving them an equitable compensation; but when the exercise of these rights stands in the way of improving the national territory, and of supplying the public markets with provisions, it must be deemed impolitic in the legislature to permit them to exist. It is very generally known, he adds, that one great obstacle to improvement, arises from a laudable anxiety in the customary tenants, to have their little patrimony descend to their children. These small properties (loaded with fines, heriots, &c. joined to the necessary expence of bringing up and educating a numerous family) can only be handed down from father to son by the utmost thrift, hard labour, and penurious living: and every little saving being hoarded up for the payment of the eventful fine, leaves nothing for the expence of travelling to see improved modes of culture; to gain a knowledge of the management and profits of different breeds of live stock, and to be convinced, by ocular proofs, that their own situations are capable of producing similar advantages: and even should they be half inclined to adopt a new practice, prudence whispers, that should the experiment fail, it would require the savings of many years to make good the deficiency. Customary tenures are therefore allowed on all hands, he thinks, to be a great grievance, and a check to improvement. This, he thinks, might be done away on

the division of common rights. The yearly value of the various customs, fines, &c. might be settled by commissioners, and twenty five, or any reasonable number of years' purchase, on this yearly value, be the price of the enfranchisement, which might be paid in money or in land, at the option of the copyhold or customary tenant. It is impossible, says this writer, that any solid argument can be urged against the propriety of abolishing, without delay, every remain of the feudal system, where it tends, in the smallest degree, to obstruct the general improvement of the country. This may, it is supposed, be accomplished with very little trouble. All that appears necessary, in regard to customary or copyhold lands, for instance, is, either to adopt the plan delineated above, or to pass one general act of parliament, empowering those who hold their estates only mediately of the crown, but immediately of a subject or superior, to demand of that superior, that, by means of a legal proof, he shall ascertain the actual yearly value in money or grain of the fines payable on the alienation of the property, the death of the superior or lord, or of the copyholder. Where personal services are payable, as mowing peats, carrying letters, &c. the value of these should also be ascertained, and the proprietors, so situated, have it in their power to become independent, by paying a reasonable number of years' purchase, or by making payment annually of the sum thus ascertained to be the value of these fines and services. Were such an arrangement to be made, customary tenants or copyholders would, says he, have an inducement to cultivate their lands in the best possible manner; because they, not the superiors, would reap the profits arising from improved cultivation.

Whether the methods here proposed by Mr. Donaldson be the most proper and convenient or not, there cannot be any doubts, but that all those obstacles and restraints which have the operation of retarding and preventing the improvement of the soil, should be removed as speedily as the different nature of their circumstances will permit. See **COPYHOLD and LAND.**

CUSTOMARY Tenants, are those who hold their estates, in consequence of the kindness and indulgence of successive lords of manors, according to particular customs established in their respective districts; and therefore, though such estates are still held at the will of the lord, and are in general so expressed to be held in the court-rolls, yet that will is qualified, restrained, and limited, to be exercised according to the custom of the manor. This custom, being suffered to grow up by the lord, is looked upon as the evidence and interpreter of his will, which is no longer arbitrary and precarious, but fixed and ascertained by the custom to be the same, and no other, that has time out of mind been exercised and declared by his ancestors. A copyhold tenant is therefore now full as properly a tenant by the custom, as a tenant at will; the custom having arisen from a series of uniform wills. And therefore it is rightly observed by Calthorpe (on Copyholds, 51. 54.) that copyholders and customary tenants differ not so much in nature as in name; for although some be called copyholders, some customary, some tenants of the verge, some base tenants, some bond tenants, and some by one name and some by another, yet they all agree in substance and kind of tenure;—all the said lands are holden in one general kind, that is, by custom and continuance of time; and the diversity of their names doth not alter the nature of their tenure. See **COPYHOLD.**

CUSTOM-HOUSE, an office established on the frontiers of a state, or in some chief city, or port, for the receipt of the customs and duties of importation and exportation,

tion, imposed on merchandizes, by the authority of the sovereign, and regulated by tariff, or books of rates.

There are several custom-houses in the several ports of England: the most considerable is that of London. It is under the direction of nine commissioners appointed by patent; who have the charge and management of all the customs (the petty farms alone excepted) in all the ports of England.

Other officers are, a secretary, solicitors, receiver-general, comptrollers of the issues and payments of the receiver-general, comptroller-general, patent comptroller, patent collector, inspector of the out-port collectors' accounts, inspector-general of the exports and imports, register-general of all ships of Great Britain, surveyors-general, surveyors of the out-ports, register of the seizures, receivers, collectors and surveyors, in various departments, searchers, &c. all holding their places by patents: with other inferior officers, appointed by warrant from the board of treasury.

CUSTOMS and SERVICES. See CONSUETUDINIBUS, &c.

CUSTOR, in *Geography*, a river of Hungary, which runs into the Theis near its conflux with the Danube.

CUSTOS, PETER, in *Biography*, a painter, born in Antwerp, sometimes also called Peter Balthasar, and more commonly Balthus. He was received into the company of painters at Antwerp, in the year 1579, and excelled in his representations of fairs, village feasts and landscapes, in the style of Peter Breughel. According to Heineken, he published, under the name of Balthasar, a book of the Geologies of the Counts of Flanders, enriched with forty portraits and figures—The arms and devices of the knights of the golden fleece, &c.

CUSTOS, DOMINICUS, the son of the preceding Custos, who was also a native of Antwerp, and at first called Balthus, but being afterwards established as an engraver and printseller at Augsbouurg he resumed his real name *Custos*. He died in 1612, leaving three sons, Raphael, David, and Jacob, who were also engravers. The plates of this artist are neatly executed, but they discover a want of taste, and a stiffness which renders them disagreeable to the eye. The following are amongst his best works: "Fuggerorum et Fuggerarum Imagines," a book in folio, containing 64 portraits, 1593, very rare. A second edition was afterwards published at Augsbouurg, augmented by others of Lucas and Wolfgang Killian to the number of 127. "Effigies pictorum ac doctorum aliquot Virorum, ad vivum delineatæ, et æri incisæ per Dom. Custos, 1594," 12 pieces. "Tyrolensium Principum Comitum genuinæ Eicones, 1599," containing 28 plates, full lengths, folio. He also engraved after Baroccio, Paul Brill, Bassan, the Caracci and other masters. His mark is composed of the letters D. C. united with an A and an F. Strutt. Heineken.

Custos Brevium, the name of an office belonging to the court of common pleas, executed by four persons, and two deputies, &c. who receive and keep all the writs, and put them upon files, every return by itself; and at the end of each term, receive of the prothonotaries all the records of the *nisi prius*, called the *postas*.

The writs are first brought in by the clerks of assize of every circuit to the prothonotary, who enters the issue in the causes, to enter judgment. Four days after the return, the prothonotary enters the verdict, and judgment thereupon, into the rolls of the court; and then delivers them over to the *custos brevium*.

The *custos brevium* also makes entry of writs of covenant,

and concords on fines; and makes copies and exemplifications of all writs and records in his office, and of all fines levied: the fines, when engrossed, are divided between the *custos brevium* and chirographer; the former keeping the writ of covenant and the note, the latter the concord and foot of the fine. This officer is made by the king's letters patent.

In the court of king's bench there is likewise a *custos brevium & rotulorum*, who files such writs as are there used to be filed, and all warrants of attorney; and transcribes or makes out records of *nisi prius*, &c. This office is held by two persons.

Custos placitorum coronæ, in our *Ancient Writers of Law*, seems to be the same with him we now call *custos rotulorum*, which is mentioned in the writ *de odio & alio*.

Custos rotulorum, an officer who has the custody of the rolls, or records of the sessions of peace; and, some say, of the commission of peace itself.

He is always a justice of the peace and quorum, in the county where he hath his office; and being the principal civil officer in the county, as the lord lieutenant is the chief in military command, he is generally selected on account of his wisdom, countenance, or credit. By the 37 Hen. VIII. c. 1. (altered by 3 and 4 Edward VI. c. 1, but restored by 1 Will. c. 21.) no person shall be appointed to the office of *Custos rotulorum*, but such as shall have a bill signed with the king's hand for the same; which shall be a sufficient warrant to the lord chancellor to make a commission, assigning and authorizing thereby the same person to be *custos rotulorum*, until the king hath by another bill with his own hand appointed one other person to have the same office, by himself, or his sufficient deputy, learned in the laws, and meet and able to supply the said office. By his office he appears to be rather a minister than a judge: because the commission of the peace, by express words, lays this special charge upon him; *Quod ad dies & loca prædicta, brevia, præcepta, processus, & indictamenta prædicta coram te & dictis sociis tuis venire facias*. It is his province to appoint the clerk of the peace.

Custos spiritualium, the person who exercises spiritual or ecclesiastical jurisdiction in any diocese, during the vacancy of the see.

This, by the canon law, belongs to the dean and chapter; but, in England, to the archbishop of the province, by prescription: though divers deans and chapters do challenge it, by ancient charters, from kings of this land.

If the archiepiscopal see be vacant, the spiritual jurisdiction is committed to the dean and chapter. (2 Ról. Abr. 22, 223.) The guardian of the spiritualities may be either guardian in law, *jure magistratus*, as the archbishop is of any diocese in his province; or guardian by delegation, being the person whom the archbishop or vicar-general doth for the time appoint. The *Custos spiritualium* hath all manner of ecclesiastical jurisdiction of the courts, power of granting licences and dispensations, probate of wills, &c. during the vacancy, and of admitting and instituting clerks presented; but such guardian cannot, as such, consecrate or ordain, or present to any benefices. Stat. 13 Eliz. c. 12. Wood's Inst. 25, 27.

Custos temporalium, the person to whose custody a vacant see was committed by the king as supreme lord; who, as a steward of the goods and profits, was to give an account to the escheator, and he into the exchequer.

His trust continued till the vacancy was supplied by a

successor, who obtained the king's writ *de restitutione temporalium*; which was commonly after consecration, but sometimes before. See *CUSTODY of temporalities*.

CUSTREL. The shield bearer among the ancients was so called.

CUSTRIN, or **KUSTRIN**, originally *Köstryn*, in *Geography*, from a large lake of that name between Custrin and Sonnenburg, is a handsome and strongly fortified town of Prussia, in the Newmark of Brandenburg, on the confluence of the rivers Oder and Warther, surrounded on all sides by marshes and morasses, 21 miles N.E. of Frankfort on the Oder, and 65 miles east of Berlin. The approach to Custrin on the side of the middle mark is by a causeway of nearly four miles in length, which has not less than thirty-six bridges; and on the side of the Newmark by another causeway, which has seven bridges.

In 1758 the Russians under general Fermor reduced Custrin to a heap of ruins by means of bombs and red-hot bullets: but the fortifications commanded by the brave Prussian colonel Shack de Wuthenow held out against their attempts; and the great Frederick having raised the siege and beat the Russians at Zorndorf, lodged the Russian officers his prisoners along with the common soldiers in the casemates, and pointing at their uncomfortable quarters, observed that they were indebted to their own cruelty for the badness of their accommodations.

Different, however, has been the fate of Custrin in 1806. Panic-struck at the rapid advances of the French after the memorable battle of Jena, or confident that there was no Prussian army near to relieve the town, colonel Ingersleben, who commanded at Custrin in October 1806, surrendered on capitulation to marshal Davoust, on the 31st of the same month. The garrison, which consisted of 4000 men, were made prisoners of war, and marched to France. The officers were permitted to return to their respective homes on parole. When the French entered the town on the first of November, they found 90 cannons on the ramparts, and immense magazines in the place.

CUT, in *Inland Navigation*, denotes the same with canal, branch, or arm. See **CANAL**.

CUT, in *Agriculture*, is a term often used to signify the operation of castrating or gelding young animals, as lambs, calves, fowls, &c.

CUT. There are six cuts established for the use of the cavalry to be made with the broad sword or sabre, for which see **SWORD-EXERCISE**.

To cut off, is to intercept or separate a party, detachment, or convoy from the army, corps, or place it belongs to or is destined for; or to separate one part of an army from the rest, and either take them prisoners, or destroy them. It is a phrase variously applied and in familiar use.

To cut off an enemy's retreat, is to manœuvre in such a manner, as to prevent an hostile army or body of men from returning when closely pressed, either to their entrenchments or to a fortified town, which they had sallied or marched out from; or to prevent a detachment, advanced corps, or part of an army from leaving a position they have occupied, and retiring to another position in order to effect a junction with the main body of their army; or to prevent an hostile army or corps, that enters a country for the sake of making incursions, or for the purpose of conquest, whether the attempt be made by land or water, from returning within their own frontiers or on board their ships; or to reduce them to such difficulties without both sustaining a great loss of men and leaving many things behind them, and thereby to force them for the sake of re-embarking without molestation into a convention on terms neither very advantageous nor very ho-

nourable, as happened last war at the Helder. Armies may be cut off either in toto, or in part, through the ignorance, timidity, or mismanagement of those who command them, or through the superior talents and skill of an enemy's general, who amidst the hurry, confusion, noise, and defolation, that generally attend pitched battles, suddenly takes advantage of some opening in the wings or centre of his enemy's army, or of those favourable incidents which occur in every engagement. When an army is superior in numbers to another, provided it be not too numerous for all its parts to be easily managed for the purposes of co-operation, and is commanded by a skilful and intelligent officer, it may always cut off a part at least of the forces opposed to it when they come into action.

To cut short, a sort of cant phrase among military people; as when they say, that soldiers are cut short of their pay, or their allowances, &c.

To cut up, to kill or destroy: When we say that the cavalry went in pursuit of a flying enemy, and cut the most of them up, we mean, that the cavalry killed or destroyed the most of them.

To cut through, to penetrate, to open a passage or cut a way through. A small body of resolute and brave men, will sometimes, when surrounded or in difficulties, extricate itself from apparent captivity or destruction by opening or cutting a passage for themselves through superior force. The Roman history affords many, and the British several instances of this nature.

CUT a feather, in *Sea Language*, is when a well-bowed ship so swiftly presses the water, that it foams or froths.

To cut the sail, is to unfurl it, and let it fall down.

To cut and run, is to cut the cable and make sail instantly, without waiting to weigh anchor.

CUT-bastion. See **BASTION**.

CUT-purse, in *Law*; if any person *clam & secreté*, and without the knowledge of another, cut his purse, or pick his pocket, and steal from thence above the value of twelve pence, it is felony excluded clergy. 8 Eliz. c. 4. 3 Inf. 68.

Cut-purses or *saccularii* were more severely punished than common thieves, by the Roman and Athenian laws.

CUT-roof. See **ROOF**.

CUT-water, the sharp part of the head of a ship below the beak. It is so called because it cuts or divides the water before it comes to the bow, that it may not come too suddenly to the breadth of a ship, which would retard her. See **SHIP**.

CUT-water, in *Ornithology*, the Sea-crow of Edwards, Black-skimmer of Latham, and *RYNCHOPS nigra* of Gmelin; which see.

CUTACIUM, in *Ancient Geography*, a town of Asia, in Armenia.

CUTAMBULI, in *Medicine*, a name given by the old writers to certain worms bred under the skin, and causing by their creeping a very uneasy sensation. Afterwards the same word was used to express certain uneasy itchings caused by a scorbutic habit, and resembling the crawling of worms.

CUTANEOUS, from *cutis*, the skin, belonging or relating to the skin. Thus we say cutaneous disease, cutaneous eruption, &c.

CUTANEOUS diseases, or *eruptions*, comprise all the variety of discolorations, spots, and excrescences, which arise on the skin, and which have obtained various appellations, according to the difference of their forms; such as pimples, pustules, vesicles, scales, rashes, tubercles, &c. (which see respectively.) The modifications of these, again, constitute

the different *genera* of cutaneous disease; as the small-pox, measles, itch, leprosy, &c.; some of which are accompanied with fever, and complete their course in a stated time, and by regular stages; others, in much greater number, are chronic diseases, and are irregular and various both in appearance and duration. The chronic diseases of the skin are often tedious and difficult of cure; and the utility of the remedies, recommended by physicians and surgeons, has been considerably diminished by the inaccuracy with which the diseases have been described, so that medicines, which had been found efficacious in one form of disease, have been misapplied to others, and their efficacy denied. Many modern writers, indeed, have contented themselves with one or two general terms, such as *scorbutic*, *herpetic*, and *leprosy*, by which they have indiscriminately designated all cutaneous eruptions. So long as this inaccuracy of language is continued, little improvement can be expected in our knowledge of the nature and treatment of these diseases. It is fortunate, therefore, that we have now an arrangement of cutaneous diseases, in which each is considered according to its external character, as consisting of one or other of the simple forms above-mentioned, viz. of pimples, scales, &c. This arrangement was devised by Dr. Willan: the following is an outline of it.

Orders and Genera of Cutaneous Diseases.

Order I. Papulæ (*Pimples.*)

Genera.

Strophulus (Red gum, tooth eruption, &c.)
Lichen (Spring eruption, scorbutic pimples, &c.)
Prurigo (Gratelle, or universal itching of the skin.)

Order II. Squamæ (*Scaly diseases.*)

Lepra (Leprosy of the Greeks.)
Pсориазис (Dry or scaly tetter.)
Питириазис (Dandriff.)
Иктыозис (Fish-skin.)

Order III. Exanthemata (*Rashes.*)

Rubeola (Measles.)
Scarlatina (Scarlet fever.)
Urticaria (Nettle rash.)
Roseola (Rose rash.)
Purpura (Purple or scorbutic rash.)
Erythema (Red rash.)

Order IV. Bullæ (*Large irregular Bladders.*)

Erysipelas (St. Anthony's fire.)
Femphigus (Vesicular fever.)
Pompholyx (Water-blebs.)

Order V. Vesiculæ (*Vesicles.*)

Herpes (Ring worm, shingles, wild fire, &c.)
Varicella (Chicken pox, and swine pox.)
Vaccinia (Cow-pox.)
Miliaria (Miliary eruptions.)
Eczema (Heat eruption.)
Apthæ (Thrush.)

Order VI. Pustulæ (*Pustules.*)

Impetigo (Running tetter.)
Ecthyma (Large inflamed pustules.)
Variola (Small pox.)
Scabies (Itch.)
Perri'o (Cold head, honey-comb-scab, &c.)

Order VII. Tubercula (*Tubercles.*)

Phyma (Boils, carbuncles, &c.)
Verruca (Warts.)
Molluscum (Small soft wens.)
Vitiligo (White smooth tubercles.)
Aene (Stone pock, red tuberculated face, &c.)
Lupus (or Noli me tangere.)
Elephantiasis (Arabian leprosy.)
Frambæsiâ (Yaws.)

Order VIII. Maculæ.

Ephelis (Sun spots.)
Nævus
Spilus, Moles, and other original marks.

Every one of these *genera* is subdivided into *species*, so as to include all the modifications of cutaneous disease.

There is a simplicity, and, comparatively speaking, a facility of discrimination, connected with this arrangement, as founded exclusively on external character, which render it worthy to be studied; and it is only by the use of one common nomenclature, like this, that writers on diseases of the skin will be enabled to make themselves intelligible, or to understand each other. See each *Genus* in alphabetical order. See also Willan's Description and Treatment of Cutaneous Diseases, &c.

CUTANEUS COLLI, in *Myology*, a name given to the platysma myoides.

CUTANEUS externus nervus, in *Neurology*, is the same with the musculo-cutaneous nerve of the upper extremity.

CUTANEUS internus nervus, is a superficial nerve of the upper extremity. See NERVE.

CUTCH, in *Geography*, a territory of considerable extent in Hindoostan, situated in the S.E. of Sindy;—the eastern branch of the Indus separating the two countries. It extends along the northern coast of the gulf of Cutch, and is separated from Guzerat by the Puddar river, or one of its branches. The present capital and residence of its rajah is *Boodge-boodge*, which see. Cutch is composed chiefly of hills, woods, and sandy wilds, but its interior part is very much unknown. The mouths of several rivers appear in the map of its coast; and the ancient maps describe the Puddar river as discharging itself into the gulf of Cutch, through these openings. Major Rennell thinks it possible, that the river formed by the Coggar, and other streams, may discharge itself by one of these openings: unless it loses itself in the sand of the desert, which borders on the north of Cutch. On the S. coast of the gulf of Cutch is a district inhabited by a piratical tribe, named "Sangarians," who cruize for merchant ships as far to the west as the gulf of Persia. The capital of this state is Noanagur; Bate or Bait, and Aramroy, are its principal ports. The Ayin-Acharee takes notice of the founding of Noanagur by a rajah, who was driven out of Cutch about 300 years ago; and says, that the territory in which it is situated is named "Little Cutch."

The province of Cutch, as well as the western parts of the peninsula of Guzerat, are governed by rajahs of their own; and do not seem to have undergone much change by the late revolutions in Hindoostan. Cutch is not only a barren country, but in its nature too strong to be easily attacked. And the western part of Guzerat is mountainous and woody; and inhabited by a wild, hardy race; and therefore, on both accounts, unfavourable to the progress of a Mahratta army.

CUTHA, in *Ancient Geography*, a country of Asia, in Assyria. See CUSH.

CUTHBERT,

CUTHBERT, St. the 6th bishop of Durham, who died A.D. 686, in a hermitage upon the Farne islands, having resigned the bishopric of Lindisfarne, or Holy island, about two years before. His body was brought to Lindisfarne, where it is said to have remained until a descent of the Danes, about 763, when the monastery was nearly destroyed. The monks on this occasion fled to Scotland, with the relics of St. Cuthbert, which they deemed their chief treasure. Many fabulous stories are recorded with regard to the migrations and miracles of the body of this saint through various parts of Scotland and the north of England: at length, however, the saint is said to have chosen for his place of residence a place named Wardlaw or Wardilaw, in a forest called Danholeme near Chester-le-Street, whither the bishop's see had been transferred. It is said that the Northumbrian catholics keep secret the precise spot of the saint's sepulchre, which is only entrusted to three persons at a time. When one dies, the survivors associate to them, in his room, a person judged fit to be the depository of so important a secret. The Entrochi found among the rocks of Holy island, are denominated "St. Cuthbert's beads." While forming these beads he is supposed to sit during the night upon a certain rock, and use another as his anvil. This saint's legend contains many other stories not more probable.

CUTHBERT'S Beads, in *Natural History*; these Mr. Walcott has shewn to be separated joints of the Entrochus, of which he has figured several in his "Petrifications found near Bath," *fig. 61*. These abound in some of the Bath free-stone strata, particularly in the stone-pits used for making of the new road leading from King's-down to Bradford; where also pundibs, both smooth and striated, high-waved cockles, and two other curious fossil shells (*figs. 32 and 37.*) are found in abundance.

CUTHBERT duck, in *Ornithology*. See ANAS.

CUTHITES. See CUSH.

CUTICLE, in *Vegetable Anatomy*. See BARK, CORTEX, and EPIDERMIS.

CUTICULA, in *Anatomy*, is the inorganic, and insensible covering, which universally invests the surface of the cutis, or true skin. See SKIN.

CUTICULAR GLOVE, in the Phil. Transf. denotes a separation of the *cuticle* from the *cutis*, from the writ to the finger-ends, &c. in the form of gloves, occasioned by a singular kind of fever. See the case and history related, *ibid.* vol. lix. N 38. an. 1769.

CUTILLÆ, or **CUTILA**, in *Ancient Geography*, a town of Italy, in the country of the Sabines, E. of Reate. It is spoken of by the ancients as a considerable city, famous for its sulphurous waters. This country, and that of Reate, were, according to Varro, the most elevated part of Italy, and called *Umbilicum*, or the "the navel" of Italy. The town was situated on the banks of a lake called *lacus Cutillensis*. In this lake were floating islands, and Pliny relates that a kind of moving forest was observed in it. The waters were reckoned salubrious, and used for fortifying the stomach and nerves. Suetonius says, that the emperor Vespasian resided here during the summer, and according to Xiphilinus, this was the place in which he died.

CUTINA, a town of Italy, in the country of the Vestini.

CUTIS, in *Anatomy*, is the strong, vascular, and sensible membrane; which every where covers the surface of the body, and constitutes the organ of touch: it is also called dermis and true skin. See SKIN.

CUTLER, a military artificer, whose business is to forge, temper, and mount all sorts of sword-blades.

CUTLERIAN LECTURES, lectures on mechanics founded in 1664 by sir John Cutler, who appointed a salary of 50*l.* a year, and settled it upon Mr. Hooke for life; the president, council, and fellow of the royal society, being entrusted to appoint both the subject and number of the lectures.

CUTLERY. Under this head we shall comprise the articles knives, forks, razors, and scissors. They are all either made of steel or of iron, with steel to form the edge.

Three kinds of steel are made use of in the manufacture of different articles of cutlery, *viz.* common steel, shear-steel, and cast-steel; these different kinds are made from what is termed blistered steel, which has hitherto been obtained of good quality only from certain kinds of bar iron brought from Sweden and Russia.

The bar iron is stratified with powdered charcoal in a furnace termed a converting furnace, within a recess termed a pot, from 7 to 14 feet long, 3 feet broad, and 2½ feet deep, the whole covered close up with a mixture of clay and sand, so as to prevent the access of atmospheric air. A strong heat is applied for about 8 days; as soon as the pot is cooled, which is in about 8 days more, the bars are taken out, and the iron is found to be converted into steel; it always appears blistered upon the surface, and hence is termed blistered steel. When these bars are taken to the tilt, and drawn into rods of various dimensions, it is called common steel. All the cheaper cutlery are made of this steel, and also all kinds of forks.

When a number of bars of blistered steel are laid together, heated to a welding heat in a forge furnace, and drawn down into bars under a forge hammer, they constitute what is termed shear steel. It has received this name from its being made use of to make wool shears. It is also termed Newcastle steel, from having been first made at that place.

Shear steel is exceedingly kind and tough. All the edge tools which require great tenacity without great hardness, are made of it, such as table-knives, scythes, plane-irons, &c. It is also freer from flaws, on account of the welding heat which has been given to it.

Cast-steel is formed by melting blistered steel in covered crucibles, and pouring it into cast-iron moulds, so as to form it into ingots: these ingots are then taken to the tilt and drawn into rods of suitable dimensions. No other than cast-steel can assume a fine polish, and hence all the finer articles of cutlery are made of it, such as the finest scissors, pen-knives, razors, &c.

Formerly cast-steel could only be worked at a very low heat; it can now be made so soft as to be welded to iron with the greatest ease. Its use is consequently extended to making very superior kinds of chisels, plane-irons, &c.

Forging of Table Knives.

Two men are generally employed in the forging of table knives, one called the foreman or maker, and the other the striker.

The steel called common steel is employed in making the very common articles; but for the greatest part of table knives which require a surface free from flaws, shear-steel is generally preferred. That part of the knife termed the blade, is first rudely formed and cut off. It is next welded to a rod of iron about ½ inch square, in such a manner as to leave as little of the iron part of the blade exposed as

C U T L E R Y.

possible. A sufficient quantity of the iron now attached to the blade, is taken off from the rod to form the bolster, or shoulder and the tang.

In order to make the bolster of a given size, and to give it at the same time shape and neatness, it is introduced into a die, and a swage placed upon it; the swage has a few smart blows given it by the striker. This die and swage are by the workmen called prints.

After the tangs and bolster are finished, the blade is heated a second time, and the foreman gives it its proper anvil finish; this operation is termed *smithing*. The blade is now heated red-hot and plunged perpendicularly into cold water. By this means it becomes hardened. Being thus hardened, it requires to be tempered regularly down to a blue colour: in this state it is ready for the grinder. Forks are generally a distinct branch of manufacture from that of knives, and are purchased of the fork makers by the manufacturers of table knives, in a state fit for receiving the handles.

The rods of steel from which the forks are made, are about $\frac{3}{4}$ inch square. The tang and shank of the fork are first roughly formed. The fork is then cut off, leaving at one end about 1 inch of the square part of the steel. This part is afterwards drawn out flat to about the length of the prongs. The shank and tang are then heated, and a proper form given to them by means of a die and swage. The prongs are afterwards formed at one blow by means of the stamp; this machine is very similar to that used in driving piles, but it is worked by one man. It consists of a large anvil fixed in a block of stone nearly on a level with the ground. To this anvil are attached two rods of iron of considerable thickness fixed 12 inches asunder, perpendicularly to the anvil, and diagonally to each other. These are fastened to the ceiling. The hammer or stamp, about 100 lbs. in weight, having a groove on either side corresponding to the angles of the upright rods, is made to slide freely through its limited range, being conducted by its two iron supporters. A rope is attached to the hammer which goes over a pulley on the floor of the room above, and comes down to the person who works the stamp: two corresponding dies are attached, one to the hammer, and the other to the anvil. That part of the fork intended to form the prongs, is heated to a pretty white heat and placed in the lower die, and the hammer containing the other die, is made to fall upon it from an height of about 7 or 8 feet. This forms the prongs and the middle part of the fork, leaving a very thin substance of steel between each prong, which is afterwards cut out with an appropriate instrument called a *file-pres*. The forks are now annealed by surrounding a large mass of them with hot coals, so that the whole shall become red-hot. The fire is suffered gradually to die out, and the forks to cool without being disturbed. This process is intended to soften, and by that means to prepare them for filing. The inside of the prongs are then filed, after which they are bent into their proper form and hardened. When hardened, which is effected by heating them red-hot and plunging them into cold water, they are tempered by exposing them to the degree of heat at which grease inflames.

Penknives are generally forged by a single hand with the hammer and the anvil simply. The hammer in this trade is generally light, not exceeding $3\frac{1}{2}$ lbs. The breadth of the face, or the striking part, is about one inch, if broader it would not be convenient for striking so small an object. The principal anvil is about 5 inches, and 10 upon the face, and is provided with a groove into which a smaller anvil is wedged. The smaller anvil is about 2 inches square

upon the face. The blade of the knife is first drawn out at the end of the rod of steel, and as much more is cut off along with it as is thought necessary to form the joint. The blade is then taken in a pair of tongs, and heated a second time to finish the joint part, and at the same time to form a temporary tang for the purpose of driving into a small haft used by the grinder. Another heat is taken to give the blade a proper finish. The small recess called the nail hold, used in opening the knife, is made while it is still hot by means of a chisel, which is round on one side, and flat on the other.

Penknives are hardened by heating the blade red-hot and dipping them in water up to the shoulder. They are tempered by laying them side by side, with the back downwards upon a flat iron plate laid upon the fire where they are allowed to remain till they are of a brown or purple colour.

The blades of pocket knives, and all that come under the denomination of spring knives, are made in the same way.

The forging of razors is performed by a foreman and striker as in making table knives.

They are generally made of cast-steel. The rods as they come from the tilt are about $\frac{1}{2}$ inch broad, and of a thickness sufficient for the back of the razor.

There is nothing peculiar in the tools made use of in forging razors: the anvil is a little rounded at the sides which affords the opportunity of making the edge thinner, and saves an immense labour to the grinder.

Razors are hardened and tempered in a similar manner to penknives. They are however left harder, being only let down to yellow or brown colour.

The forging of scissors is wholly performed by the hammer, and all the sizes are made by a single hand. The anvil of the scissor-maker weighs about $1\frac{1}{2}$ cwt.; it measures on the face about 4 by 11 inches. It is provided with two gates or grooves for the reception of various little indented tools termed by the workmen *bosses*; one of these bosses is employed to give proper figure to the shank of the scissors; another for forming that part which has to make the joint; and a third is made use of for giving a proper figure to the upper side of the blade. There is also another anvil placed on the same block containing two or three tools called *beak irons*, each consisting of an upright stem about 6 inches high, at the top of which projects a horizontal beak; one of these beaks is conical, and is used for extending the bow of the scissors, the other is a segment of a cylinder with the round side upwards containing a recess for giving a proper shape and smoothness to the inside of the bow.

The shank of the scissors is first formed by means of one of the bosses, above described, leaving as much steel at the end as will form the blade. A hole is then punched about $\frac{1}{2}$ inch in width a little above the shank. The blade is drawn out and finished, and the scissors separated from the rod a little above the hole. It is heated a third time, and the small hole above mentioned is extended upon the beak-irons so as to form the bow. This finishes the forging of scissors. They are promiscuously made in this way without any other guide than the eye, having no regard to their being in pairs. They are next annealed (for the purpose of filing such parts of them as cannot be ground) and afterwards paired.

The very large scissors are made partly of iron, the blades being of steel.

After the forging, the bow and joints, and such shanks as cannot be ground, are filed. The rivet hole is then bored, through which they are to be screwed or riveted together. The common kind of scissors are only hardened up to the joint. They are tempered down to a purple or blue colour. In this state they are taken to the grinder.

Grinding

CUTLERY.

Grinding and polishing of Cutlery.

The various processes which come under this denomination are performed by machinery, moving in general by the power of the steam engine or a water wheel.

Grinding wheels or grinding mills are divided into a number of separate rooms; every room contains six places called troughs; each trough consists of a convenience for running a grindstone and a polisher at the same time, which is generally occupied by a man and a boy.

Two of the above troughs are represented in *Plate I. Cutlery*: *A* is a wooden wheel, called a drum, the axis of which run through the whole length of the room. On the same axis are placed three other drums, one of the same length with the above, and two of half the length. Each of the large drums carries four straps, which give motion to the two stones *c, c*, and to the polishers *b* and *e*, by passing round their respective pulleys *g, g, g, g*: *d, d, d, d*, are the places where the workmen sit, and as he sits astride for the purpose of leaning over the stone, the seat is termed a horse.

The business of the grinder is generally divided into three stages, viz. grinding, glazing, and polishing.

The grinding is performed upon stones of various qualities and sizes, depending on the articles to be ground. Those exposing much flat surface, such as saws, fenders, &c. require stones of great diameter, while razors whose surface is concave, require to be ground upon stones of very small dimensions. Those articles which require a certain temper, which is the case with most cutting instruments, are mostly ground on a wet stone; for which purpose the stone hangs within the iron trough *H*, filled with water to such a height that its surface may just touch the face of the stone.

In the manufactories of Sheffield not less than five various qualities of stone are employed. The most valuable of the five is termed the Wickersley stone, from its being brought from a village of that name, about nine miles east of Sheffield.

It is of the sandstone kind, rather firmly indurated, of a compact texture. It appears to consist of very hard silicious particles cemented together with a softer medium. Both in the wet and dry state, it cuts with great facility, and is particularly adapted for grinding razors, penknives, table knives, and the inside of the blade of scissors.

Another very useful stone is termed the whitening stone. It is of a bluish white colour, exceeding the Wickersley stone in hardness, in firmness, and in closeness of texture. It is particularly employed for grinding the outside of the blade of scissors, and other articles requiring great smoothness and neatness of shape.

Forks, and the shanks of some scissors, are ground upon a dry stone, termed the fork-stone. It is a very sharp grit stone of a whitish colour, very similar to that of which millstones are formed. The stones employed for grinding saws and files are of a similar quality with the fork-stone, of a yellowish grey colour.

It is necessary that the stones move with a certain velocity, in order to produce a maximum of effect.

If the velocity be too great, two evils are generally to be expected: the first (which is most to be dreaded) is the breaking of the stone, the second is the stone almost ceasing to cut; this is also the case with drills, files, and other similar instruments; if they move too rapidly over the surface they are cutting, they generate much heat, but do not cut so well.

The surfaces of all stones are contrived to move with about the same velocity. This is effected by means of different sized pulleys. The drums above described are

four feet in diameter, and make from 120 to 140 revolutions in a minute, and the pulley on the axis of the stone must be of such diameter as to cause the surface of the stone to move at the rate of from 600 to 700 feet per second.

We cannot wonder at the dreadful effects of the breaking of a stone when we consider the great velocity with which they move. The horse or seat of the workman projects over the centre of the stone, and is secured to a beam of wood on a level with the ground by means of a strong chain. This in some measure secures the workman from those pieces of the stone, which might be projected upwards against the under side of the horse. But as it is quite uncertain what direction the fractured parts may take, the above contrivance is only a partial defence against these shocking accidents. It sometimes happens that the chain is broken, and the man and horse together projected to a considerable distance.

Means have been recently adopted by some of the grinders to prevent, in a great measure, the breaking of stones, which consist in a different method of fastening the stones upon the axis. The old method consists in wedging on the stone by means of wooden wedges. The improved method is to secure the stones to the axis by means of two circular plates, which are screwed firmly against the sides of the stone. By this means the parts of the stone are kept together. On the contrary, when the wedges are employed, a force is constantly exerted to break the stone; this effect is increased when the stones are used wet, from the circumstance of the wood absorbing moisture.

Glazing is a process following that of grinding: it consists in giving that degree of lustre and smoothness to an article which can be effected by means of emery of the various degrees of fineness. The tool on which the glazing is performed, is termed a glazer. It consists of a circular piece of wood, formed of a number of pieces in such a manner that its edge or face may always present the endway of the wood. Were it made otherwise the contraction of the parts would destroy its circular figure. It is fixed upon an iron axis similar to that of the stone: some glazers are covered on the face with leather, others with metal consisting of an alloy of lead and tin; the latter are termed caps. In others the wooden surface above is made use of. Some of the leather-faced glazers, such as are used for forks, table knives, edge tools, and all the coarser polished articles, are first coated with a solution of glue and then covered with emery. The surfaces of the others are prepared for use by first turning the face very true, then filling it with small notches by means of a sharp-ended hammer, and lastly filling up the interstices with a compound of tallow and emery.

The pulley of the glazer is so much less than that of the stone, that its velocity is more than double, being in general at the surface that of 1500 feet in a second. The glazer and its pulley are seen at *e* and *l*.

The process of polishing, consists in giving the most perfect polish to the different articles. Nothing is subjected to this operation but what is made of cast-steel, and has been previously hardened and tempered.

The polisher consists of a circular piece of wood covered with bull leather, the surface of which is covered from time to time, while in use, with the crocus of iron, called also co-leather of vitriol.

The polisher requires to run at a speed much short of that of the stone, or the glazer. Whatever may be its diameter, the surface must not move at a rate exceeding

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70 or 80 feet in a second. This diminished velocity is effected by causing its stop to pass over the rounded part of the axis of the drum as shewn at B.

Grinding of Table Knives.

The stones made use of are from 35 to 45 inches in diameter, and about six inches broad upon the face. This stone is a species of sand stone, before termed the Wickersley stone. It is first turned, or raised exceedingly true, and then notched upon the face with a sharp-edged tool to make it cut faster. This species of stone cuts astonishingly fast, and has the peculiar property of not heating to a great degree any substance ground upon it. It is valuable on that account for grinding those articles which have been previously hardened. Table knives are ground first upon this stone, and afterwards upon one of finer texture, called the whitening stone. This prepares them for the glazing. The glazer is about 20 inches diameter and 5 inches broad, covered on the face with thick leather. This leather is thinly coated with glue, and is rolled in a quantity of emery. As soon as the glue is set the glazer is fit for use. It runs upon an iron axis, in the same manner as the stone. The bolster of the knife, when plane, is also ground and glazed in a similar way.

Forks.

The stone on which forks are ground are from 18 to 24 inches in diameter and about $2\frac{1}{4}$ inches broad. It is a very sharp grit, something harder than that last mentioned. The face of the stone is a little rounded, for the purpose of meeting hollow parts, which are observed in all forks. The grinder holds the fork crosswise on the stone, and very dexterously gives it a kind of circular motion; by this means he makes the shank very round. The shank and neck of the prongs are ground upon this stone. The stone being dry, a profusion of sparks is given out, and the fork becomes heated with the great friction, till it is blue. The prongs are afterwards ground upon a wet stone, from 14 to 18 inches diameter and about 7 inches broad. The shank and neck of the prongs are finished upon a glazer of a similar shape to that of the stone on which they are ground; this glazer is of wood covered with leather, and prepared upon the surface with glue and emery, in the same manner as that for table knives. The prongs are finished upon a glazer of the same materials, but flat upon the face, about 8 inches both in diameter and breadth. The insides of the prongs are dressed by means of thin leather straps about 2 inches broad and 18 inches long; they are first coated with glue and then covered over with emery: as soon as the glue is set the stop is introduced between the prongs of the fork, and is drawn backwards and forwards till the part becomes sufficiently clean.

Grinding of Penknives.

The stone made use of for penknives is the Wickersley stone, about 16 or 18 inches in diameter when new, and is worn down to about 9 or 10 inches; the breadth is about $4\frac{1}{2}$ or 5 inches. This stone, as has been before observed, having so little tendency to heat the substances ground upon it, is generally made use of dry for grinding penknives. There are several advantages in grinding upon the dry stone. It does not wear so fast. The edges of the stone are kept sharper and the surface even; but the great advantage is, that the stone cuts much faster. When the surface of a dry stone becomes clogged with the particles of steel adhering to it, a piece of soft iron is always at hand, which

being rubbed over it soon clears it of its incumbrance, and a fresh cutting surface is presented.

All the finer penknives, after being ground the first time, go back to be hanoled or hafted. The handles are wrapped in paper to keep them from being soiled, and the knives thus hafted are again returned to the grinder. The blades are all slightly ground over again upon a stone kept for the purpose of one determinate size. The flat parts of the blade are next glazed upon a glazer or lap made of lead, and for common articles of wood. After the lap is turned perfectly true, and a number of notches are made in the face; the surface is rubbed over with emery and grease. If it is found to cut too keen it is slightly rubbed over with bees wax. This process would finish the common sort of knives, but the finer blades are afterwards polished upon the polisher already described.

Grinding of Razors.

Razors are generally ground upon the stones which are laid aside by the grinders of penknives and scissors. They take them when about the diameter of 8 inches, and wear them down to 4 or 5 inches. These small stones are highly proper for razors, in order to give to the blade a requisite degree of concavity and corresponding thinness to the edge. The razors are next glazed upon laps of metal, of a size corresponding with the size of the stone, and afterwards polished upon a polisher of wood covered with leather, similar to those used for penknives. The process of polishing, indeed, is always performed on the same kind of tool, differing only in size.

Grinding of Scissors.

The stones made use of by the scissor-grinder are of two kinds; the one of the same size and quality with that used for penknives, and the other of the same nature with that used in the grinding of table-knives, and which the workmen term a whitening stone. The first is employed to grind the inside of the blades, and the latter for grinding the outside. Scissors, the blades of which alone are hardened, are never sent to the grinder before they are hardened and tempered. After the blades of the scissors are ground they are returned to the maker, and are fitted and screwed together, and properly adjusted for cutting. This being done, they are taken to pieces and returned to the grinder. The scissors being slightly ground over again are finished upon their appropriate glazer. The insides of the blades, and all the other parts which are not rounded, are glazed upon a glazer of metal, of a size corresponding to the stone on which they were ground; for the inferior articles the glazer is of wood.

When the shanks of scissors are sufficiently plane to admit of grinding, they are sent to the shank-grinder, a workman solely employed in grinding the shanks and in dressing those parts of the scissors which have been filed, and which cannot be touched by the glazer.

The shanks of larger and commoner sorts of scissors are ground upon a stone similar to that used for grinding the shanks of forks, but the finer kinds are ground upon the Wickersley stone already described. Being ground, they are glazed upon a glazer of wood faced with leather, of the same size and shape with the shank of the scissor. The remaining parts of the scissors, which have been only filed and rubbed with sand but are still destitute of polish, are finished by brushing.

The brush is an instrument consisting of a circular piece of wood set upon the face with very hard bristles. Two brushes are generally employed in succession. The first

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is made use of with grease and emery, which gives a coarser sort of polish. The second is used with crocus and water to give the proper finish to the surface. If the blades of the scissors are required to be polished, which is frequently the case, they are again sent to the first grinder, who polishes them upon a polisher similar to those described for razors and penknives. It will be here proper to remark that the shanks of the above kinds of scissors, being soft, cannot assume the polish with crocus, as nothing but cast-steel in the hardened state is susceptible of that peculiar lustre. An imitation of polishing is, however, given to the soft shanks by means of a burnisher of polished hardened steel.

The more delicate and finer sorts of scissors, in order to render all the parts susceptible of polishing, are hardened quite up to the bow, in consequence of which the order of manufacturing is a little varied, from that of the scissors having soft shanks. After being forged, filed, and having the hole drilled for the screw, the insides of the blades are ground, and they are fitted and screwed together. They have next to be hardened and tempered, and as it is a common property of steel to warp during that process, the two sides of the scissors are firmly bound together by means of iron wire. The screw being withdrawn, which would be liable to be hardened along with the scissors, they are heated red-hot all over, and immersed in water up to the bow.

After being thus hardened they are heated, for the purpose of tempering them till the blades appear of a purple and the shanks of a blue colour. The wire is then taken off, and the scissors are finished by processes similar to those above described, with the difference of the shank being polished with crocus along with the blades. After the scissors return the last time from the grinder they only require to be sharpened, wiped clean and screwed together. Previous to wiping, however, they are generally put into pulverized quick-lime, which greatly tends to the preservation of their lustre by absorbing the moisture from the surface; the presence of which is well known to facilitate the rusting of polished steel.

Some of the very fine scissors are elegantly and variously ornamented. Formerly they used to be ornamented with studs of gold or polished steel, arranged round the joint of the scissor or along the shank.

The studs are each furnished with a small tang, by which they are inserted into small holes made in the scissors. The holes are made while the scissors are soft, and the studs are inserted after the scissors are polished.

More recently the same parts are inlaid with circular bits of gold, which are polished along with the scissors and afterwards ornamented on the surface by engraving. Scissors are also ornamented by means of gilding, bluing, and etching. The gilding is performed in two ways; the first by dipping the finished article into a solution of muriate of gold in alcohol; the second with metallic gold laid on by means of heat. The first kind of gilding has been rejected on account of its want of permanency. The second, though very durable, is objectionable on account of the heat employed in the process, which is so great as to make the scissors too soft.

Various devices, such as letters, coats of arms, &c. are sometimes put upon scissors, but more frequently upon razors and swords, by means of etching. The figures are drawn upon the polished surface with a varnish, made by dissolving resin in oil of turpentine. Every other part of the articles is covered with the same varnish, excepting what is to form the ground of the picture. The exposed part

is then covered with dilute nitric acid, which is suffered to remain upon it till it is supposed to be sufficiently corroded. It is then rinsed in water to take away the acid, and the varnish is removed by means of oil of turpentine. The ground of the picture appears of a dead white, while the figure, and other parts of the article, display their original polish.

Cutlery made of Pig-Iron.

Great quantities of various kinds of cutlery have been made of pig-iron, by means of casting, particularly forks and scissors. The models are made of lead, alloyed with a little antimony. The articles are cast in sand, in flasks similar to those used in casting small articles of brass. The metal employed is of that sort of pig-metal known by the name of N^o 1, from the large quantity of carbon contained in it. It fuses at a lower temperature, and becoming more liquid on that account, it is the only kind which can be used for small articles.

The metal is fused in crucibles of Stourbridge clay, in the common air furnace employed in iron founderies. The articles, when cast, are almost as brittle as glass. This, in a great measure, is occasioned by the moisture in the sand, which effects this change upon the metal in a manner similar to that by which steel becomes hardened. In order to obviate this hardness, the castings are cemented with ashes or sand, for the purpose of annealing them. Cast-iron pots of a cylindrical shape are employed for this purpose. They are about 12 inches diameter, and about the same depth. A number of these pots are filled nearly to the top with the goods to be annealed: a quantity of fine sand or ashes is then employed to fill up the interstices, and to cover them completely, so as to exclude the air. The pots are placed in a furnace, and are surrounded with small coaks, for the sake of carrying on slow combustion. They are heated very gradually to a temperature little short of fusion, and they are as gradually allowed to cool. The whole time occupied in heating and cooling is from 24 to 30 hours. They are found, after this process, to have become very soft, and to be capable of bending a little without breaking. They afterwards are finished in a manner similar to those which are forged, with the exception that they are not hardened and tempered: were they subject to that process, they would return to the same state as before annealing.

Notwithstanding the great demand which has been for cast cutlery, on account of their very low price, they are so completely destitute of utility, that ultimately they cannot fail to disgrace both the merchant and manufacturer. If a preference can be given to any of them, it is in favour of the scissors. The knives and forks are not only liable to break, but they soon turn black, and can be very little improved by the common mode of cleaning, as by the best means they are only susceptible of a miserable polish.

Various attempts have been made with a view to improve the cast cutlery, the most successful of which is by Mr. Lucas of Sheffield; and for his method he some time ago obtained a patent. By Mr. Lucas's process, the cast metal articles are converted from their brittle and crude state into malleable iron or steel at pleasure, without injuring the surface, or distorting the figure of the article. Nails of various kinds have been made in this way, more flexible and equally tenacious with those of wrought iron. This method consists in stratifying the articles, in pots similar to those employed for annealing, with an oxyd of iron. Calcined iron-stone pulverized was first made use of, but was found to make the surface of the metal so rough as to render those articles useless. This inconvenience was in some measure obviated by laying

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A thin stratum of sand between the metal and oxyd of iron. Any sort of earth, containing a portion of the oxyd of iron, is capable of bringing about this change. The red sand which abounds in some countries, or loam, or clay, containing oxyd of iron, would answer very well. The theory of this process is obvious. The cast-iron consists of iron and charcoal, or carbon; and it is to the presence of the carbon that we attribute the peculiar qualities of cast-iron different from those of a malleable iron and steel. The oxyd of iron, with which the cast-iron articles are stratified, consists of iron combined with oxygen. During the process of cementation, the oxygen of the oxyd combines with the carbon of the cast iron, forming carbonic acid, which is dissipated in the form of air. For the particulars of the process, see the articles IRON and STEEL.

Specimens of scissors, table knives and forks, and even penknives, have been made so complete by the above process, that the best judges could not distinguish them from those made of the best steel. An insurmountable objection, however, still remains, which will preclude the application of this important discovery in the manufacture of those articles which require a fine edge, and every other article which requires to be hardened and tempered.

This metal, previous to hardening and tempering, is equally tough with the best steel or iron, but afterwards becomes very brittle, at least much more so than we should expect from steel so apparently good. The reason of this will be explained under IRON and STEEL.

Handling of Table Knives.

The handles of table knives are made of ivory, bone, horn, and wood. They are formed in two different ways: one, by drilling a hole into the handle, and cementing into it the tang of the knife. This kind is by the manufacturers termed round tangs. The other kind of handle consists of two sides, which, when laid on each side of the tang, and paired together, form the handle. The two sides are termed scales, and knives of this kind are called scale tangs.

Iron handles are the most valuable, and in the greatest repute. The greatest part of them is made for the round tangs. These are of various patterns, such as octagon, oval, and fluted. The octagon and oval handles are filed into the intended form, and afterwards rubbed first with fine sand and water, and afterwards with powdered chalk and water. The fluting of the handles is performed by means of a sharp tool of the scraping kind, having the figure of the flutes upon its face.

The tangs are cemented into the handles with rosin mixed with whitening.

A very convenient and durable handle is made of stag horn. The round parts of the horn which are of proper thickness are selected for the round tangs. The outsides of the other parts of the horn are cut into scales, which make the scale tang handles. The surfaces of the stag-horn handles are invariably left in their natural state.

The small end of the ox-horn, termed the tip, is generally employed for making the handles of table knives. The tips are formed into hafts of a great variety of patterns, by means of pressing between two dies. This advantage is obtained from the well known property of horn being so soft and ductile when hot, as to admit of considerable extension. The dies employed for pressing the horn are represented in *fig. 2.* A and B, the upper and lower dies, are made to form the bits of a pair of tangs, on the even faces of which the exact figure of the handles is formed, as represented in the figure.

The pieces of horn intended to be pressed are first softened

in hot water, and then cut to the size deemed requisite exactly to fill the mould. The dies are heated to the temperature of about 400° Fahrenheit, or something short of the heat required to burn oil. The horn, with a little oil, is then laid between the dies, which are placed in the pressing vice, *fig. 3.* consisting of a compound lever, acting with a screw at A, and turning round the handle B, similar to the common vice. The force required to be given at the handle is not more than what a man may perform with ease. The motion being now reversed, the tangs are withdrawn, and the horn is found to have received the full impression of the die.

If the handles are plain, and the horn be native black, the first pressing is sufficient; if, however, they are not sufficiently black, they are dyed after the first pressing in a liquid, containing logwood and green vitriol. The process of dyeing takes off that smooth glossy surface given by the dies, which is restored by pressing them a second time in dies a little less than those employed for the first pressing. If the handles require to be fluted, or otherwise ornamented, they are pressed a second time in dies containing the intended figure.

The above handles, after they come from the press, require only to have blades inserted, and to be polished by means of rotten stone or chalk and oil.

The handles of bone are made from the shank of the ox. The thickness of the solid parts of the bone is never sufficient to make the handles equally thick with those of ivory. Some of the bones are very dense and hard, but can always be distinguished from ivory by the colour. Such handles, in order to correct their defect in colour, are dyed green in liquid, consisting of the oxyd of copper dissolved in aqua ammonia. The hartshorn of the shops, being the cheapest preparation of ammonia, is always used. The proportions are about seven ounces of the oxyd of copper to one gallon of hartshorn.

After dyeing, the blades are cemented into the handles, which are afterwards polished. When the dye does not contain any substance capable of rusting the blade, the handles are dyed after the blades are inserted.

Various kinds of wood are employed in making the handles of table knives. The very common articles have handles of birch wood, which are expeditiously made by being turned in an oval lathe. They are afterwards dyed black or red. After this they only require the blades to be put into them, and to be furnished with a smooth stone, termed blood-stone. A superior kind of wood handles are made of various foreign wood, such as lignum vitæ, ebony, &c. Handles are sometimes made of very thin silver in the sheet, and of plated copper. The thin metallic shells, which form the outside of the handle, are made in two laits, by being forced into a steel dye, by means of lead; the two sides are afterwards soldered together, and the hollow part filled up with a cement of rosin and pulverized brick. The cement serves to give firmness to the thin shell of metal, and at the same time to secure the blade.

Handling of Penknives.

The handles of penknives in general consist of three parts, *viz.* the outer scales, the inner scales, and the spring. The outer scales, which are only ornamental to the knife, are made of various substances, such as horn, stag-horn, ivory, bone, tortoise-shell, and pearl. The two latter substances are employed for the most valuable knives. The beautiful variegated horn stands the next in estimation. But the most durable scales are made of stag-horn.

The inner scales, which serve to give firmness and durability

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bility to the knife, and to which the outer scales are attached, are made of iron, brass, and sometimes of silver: the ends of the inner scales intended to receive the blade is in general made thicker, and is termed the bolster of the knife. The scales of those knives having no bolsters are cut out of thin plates of the metal of which they are made. Iron scales with bolsters are forged with the hammer.

The spring is of steel, running along the back (and in single blade knives round the end) of the handle, and serves to separate the scales from each other; and by its elasticity exerted upon the tang of the blade, it secures the knife in the situations of being shut or open. The inner scales and the spring being forged, and the outer scales being provided, they are put into the hand of a workman, who finishes the whole of the handling department.

His tools consist of a vice, a small anvil, and hammer, a variety of files, steel burnishers, a breast-plate, drill-bow, and drills of various kinds; a glazer coated on the face with emery and glue, to polish the different parts; and a buff, which is an instrument similar to a glazer; but instead of being coated with emery and glue, it is used with oil, and fine sand, and rotten-stone. It is employed to polish the surface of the outer scales. The buff and the glazer are turned by the foot, in a manner similar to that of the common street-grinder. He is also provided with a number of hardened steel plates, about one-twelfth of an inch thick, and in shape corresponding to the different patterns of the handles: each plate contains holes in situations answering to the holes in the handle, by which the spring and blade are secured in their places. The inner scales are each secured to one of the plates above, for the sake of drilling holes through them opposite to the holes in the plate. The scales are then fastened on each side of the plate by temporary pins, and the edges are filed down to the plate. By this means the handles are made exactly of the pattern required. The spring is next drilled, placed between the scales, and secured in its proper situation by temporary pins, till it is filed quite level with the edges of the scales. A hole being drilled through the tang of the blade, one of the above pins is taken out, and the spring thrown back, so as to allow the blade to pass between the bolsters, in which situation it is fastened by means of a temporary pin. The tang is then filed square, to correspond with the bolster and the spring.

The blade, the spring and the scale being properly adjusted to each other, the different parts are separated by taking out the pins.

All the visible parts of the spring are next filed smooth, and the spring bent a little inwards, for the sake of giving it greater power when placed in its intended situation. The spring is then hardened, by heating it red-hot and immersing it in water; it is afterwards tempered, by rubbing it over with grease, and heating it till the grease inflames: the visible parts being glazed and burnished, the spring is deemed finished.

Our next process is to place the outer scales of horn or other substance upon the inner scales.

Scales of horn or tortoise-shell are heated, and exposed while warm to the action of a screw-press, for the purpose of making them flat.

The scales are then made of uniform thickness, by means of filing. In the next place, the shield of tin or silver is introduced.

As this is a process of some ingenuity, at least so far as concerns the forming a recess for the different shaped shields, we shall describe the tools employed, with the assistance of the following figures.

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Fig. 2. is a plate of hardened steel, about one-twelfth of an inch thick, and of breadth and length suitable to the size of the shield. A hole is made through the plate exactly of the figure of the shield; and every different pattern of course requires a different plate. *Fig. 3.* represents the drill employed to cut the intended figure in the horn or other substance.

This differs from the common drill, in having the springs fastened into the part B. by means of two screws, A, A. The ends, b, b, are made sharp like the points of a drill, and are capable of boring up to the shoulder a a. The plate, *fig. 2.* is placed upon the scale, and fixed in the vice; the springs of the drill are then pressed till the ends, b, b, enter the hole of the plate. It is plain that if the drill be pressed and turned round, that the force of the spring will cause the cutting parts to make a figure the same as that of the plate. The depth of the recess is limited by the shoulders, a, a. The silver shields are cut out of the sheet by means of a punch; those of tin are first cast, and afterwards struck into a recess made in a die by means of the plate and drill above mentioned.

The shield being secured in its proper place, the outer scales are pinned upon the inner ones; the compound scales are next pinned together with the temporary pins, and both their edges are filed and finished together. They are again separated, and the insides of the inner scales polished; after which the blades, spring, and scales are all riveted together. The next thing is to file and burnish the joint and bolster; and lastly, to finish the outer scales. This is performed by filing, scraping, and buffing, first with fine sand, and lastly with rotten-stone.

Handling of Razors.

After the blades of razors are ground and polished, they only require to be handled and set or sharpened.

The handle of a razor consists of two sides, called scales, which are made of various substances. The most valuable are made of pearl, tortoise-shell, ivory, and native horn. The handles of the greatest quantity of razors, however, are made of pressed horn, some of which are dyed black, and others spotted to imitate tortoise-shell, and hence are termed mottled shell. Pearl is a substance very seldom made use of for the handles of razors. In the first place, they are very expensive, on account of the very high price of the shells; and secondly, they are very liable to be broken, as well in manufacturing as when in use. Ivory makes a very neat handle; but their very great expence in manufacturing, added to the great price of the raw material, renders their price very high. In the opinion of most, they are not neater, nor by any means so durable, as the handles of pressed horn. Tortoise-shell makes a beautiful handle, when used in the state in which it is cut from the shell; but on account of its high price, it is used with more economy by pressing it in a manner similar to that of horn. The pressing, however, deprives it of a great part of its beauty. No handles for elegance and durability can exceed those of native horn, when the specimens are properly selected for the purpose. Since, however, the handles of pressed horn are in no way objectionable, but, on the contrary, are the most generally preferred, we shall be more particular in the description of this branch of manufacture.

Having already described the process of pressing the handles of table knives, and since the scales of razors are pressed by a method strictly similar, it will be unnecessary to give a separate description.

The dies in which the scales of razors are pressed are made to press one pair at a time. The pieces of horn intended

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tended for pressing are in the process sometimes extended as much as two inches.

The handles of pressed horn are divided into three varieties, *viz.* the native black, consisting of horn which is black previous to being pressed; those of the second variety are such as are dyed black, or other colour, after being pressed; and handles of the third kind are those destined for mock shell, for which the most clear and colourless scales are selected.

Those of the first kind, after pressing, retain their native black, and are much esteemed for their permanent colour. The scales, which are partially coloured, are generally dyed black with a dye made of logwood and sulphat of iron: some are dyed red, and others green. The former are dyed with archill, and the latter with indigo dissolved in the sulphuric acid.

The imitation of tortoise-shell is performed by a process called spotting, which consists in the application of a composition to the surface of the horn, by which it becomes irregularly coloured.

The compound consists of one part of minium, four parts of common pot-ash, and ten parts of quick-lime: as much water is added as will give it a pulpy consistence. It is then laid upon the upper surface of the scale with a stick as carelessly as possible, and is spread thicker in some parts than in others, for the purpose of giving a variety of shades. The substance is allowed to remain upon the surface for six or eight hours; and the latter part of the time they are placed before the fire. After the composition is removed, the surface exhibits a striking imitation of tortoise shell. The singular effect of this substance is evidently the result of some chemical change. The lime appears to answer two purposes: it takes the carbonic acid from the pot-ash, and at the same time serves to give a proper consistence to the mass. The lead and the pure pot-ash together are essential to producing the effect; though, when separately applied, no change is observed. The fact is, that the colour is produced by the dissolved oxyd of lead in the alkali. A colourless solution of this kind may be advantageously used for the spotting of horn. May not this compound be found of use in giving colour to other animal substances, such as hair, leather, &c.?

The handles of razors are frequently ornamented by means of shields of various figures, some of which are of silver, others of yellow metal, and of an alloy formed of lead and tin. The silver and yellow metal shields are pressed into the substance of the horn by means of a press similar to a fly-press. The scale and the shield are placed between the two dies of a figure corresponding with the shape of the scales, the dies being previously heated to a temperature something short of that employed in the first pressing. A sufficient force is then exerted upon the screw to force the metal into the horn. Figures, letters, and other ornaments, are introduced by the same method.

The shields of lead and tin are put in by first making in the scales a proper recess, by means of the spring-drill described in *figs.* 2. and 3., and afterwards filling it with the melted metal. The greatest number of shields are of this kind.

The handles of pearl, ivory, &c. which cannot be made by pressing, have the proper shape given to them by means of the file. The shields are then introduced by first making the proper recess with the spring-drill, and afterwards securing the shield by means of rivetting, but more completely by the following method. After the shield is cut out to its proper shape, it is made concave on one side, and convex on the other; at the same time the edge is a little

bevelled towards the convex surface. The cutting part of the spring must be so formed as to make the bottom of the recess to receive the shield a little larger than at the top. The shield being then introduced with the concave side downwards, and hammered upon the convex side, becomes firmly secured.

The scales of the handle in the state already described are now fit for the reception of the blade. A piece of white metal, an alloy of lead and tin, called the bead, is next placed between the scales at one end, to allow the blade to go between when the razor is shut; the blade is then screwed in its place, and the scales fastened together by means of rivets, which are of iron, brass, and sometimes of silver. Zinc wire has been recently used for the purpose, and receives a good polish. The handles of razors in the state left by the press and the file are first scowered with sand and water, and afterwards polished upon a buff.

A superior kind of fine cutlery is manufactured in London, chiefly by the surgical instrument-makers; the excellence of which consists in the great attention paid to its fabrication; the quality of the steel, and above all to the correctness of the several temperatures under which it is hardened, and the reduction of this by the process called tempering.

The estimation these articles are held in, allows the manufacturer to employ the superior workmen, and also to reject, during any part of the process of manufacture, such articles as from slight flaws, cracks, or even any inferior quality in the steel, may be objectionable.

The process of the manufacture differs also from the circumstance of the same workman beginning and completing the article. Engines and complicated machinery are never used: therefore his skill and abilities being exerted, greater perfection is obtained. The hardening of steel depending on the quick abstraction of the heat given, different mediums are made use of, as quicksilver, water, oil, &c. The tempering, or reduction of the hardening, is not governed by the colour only, but by a more accurate method (proposed by Hartley); the exact variations of temper are given in a fluid, into which a Fahrenheit's thermometer graduated to the boiling point of mercury is immersed, and the delicacy of this operation may be sufficiently understood, from the various colours produced on the steel, at the various temperatures shewn by the thermometer. The change of scale takes place at 430, and finishes at nearly 600. Nine changes of colour are observable at about 20 degrees distance of each other, *viz.*

430 Slight colour inclining to yellow.

450 Straw colour, pale.

470 Yellow.

490 Brown.

510 Brown with purple spots.

530 Purple.

550 Bright blue.

560 Blue.

600 Blackish blue inclined to scale or oxyd.

From 430 to 470 is chiefly employed for razors, and some of the finer edged surgical instruments.

470 and 490 for penknives, and some pointed instruments.

From 510 to 550 includes pocket-knives, table-knives, carvers, scissors, &c. &c.

The experience of the workman is much required, and also a knowledge for what purpose the edge is to be employed; during these three ranges of temperature.

550 and 560 Spring temper.

Setting.

Setting.

The operation of setting an edged instrument, is the giving it a more permanent, or lasting edge, by means of a hone, or any other fine cutting stone. Every article is left from the wheel with a thin wiry or notched edge. This must be removed, and one substituted of an angular form; the more obtuse the angle, the stronger the edge, and *vice versa*. This angular edge is obtained in several ways; sometimes by the thickness of the back of the instrument, but more generally by the elevation of the back from the stone.

Razors are set upon a stone brought from Germany. Their backs being thick, they are laid perfectly flat, and rubbed backward and forward on each of their sides, till the wire or notched edge gives place to a fine smooth one. The use of a small quantity of oil on the surface of the stone is requisite.

Penknives are set upon a stone brought from Turkey, and from its property of absorbing oil, it is called an oil-stone. They are held at an elevation of the back just sufficient to keep it from touching the stone; and the greatest attention is here requisite, to give them the same exact elevation, during the removal of the wire edge. They have also a few strokes given them as a finish, upon a hard kind of green stone.

Scissors are set upon the oil-stone; they are held nearly upright, that their edges may be turned toward their inner side.

Pocket-knives, carving, and table-knives, are set at an elevation, upon a stone, called a rag-stone, of a fine sandy texture, and without the use of oil.

CUTRIGURI, in *Ancient Geography*, a people who inhabited the district adjoining to the Palus-Mæotis; and formed a part of the Huns.

CUTTABUNK, in *Geography*, one of the *Elizabeth Islands*, which see.

CUTTER, in *Sea Language*, denotes a small vessel commonly navigated in the English Channel, furnished with one mast, and rigged as a sloop. Many of these are used in an illicit trade; and others employed, under the direction of the admiralty or custom-house, by government to seize them.

CUTTER is also the name of a small boat belonging to ships of war. It is broader, deeper, and shorter than the barge or pinnace: fitter for sailing; and usually employed in carrying stores, provisions, &c. to and from the ship. Clincher-work is used in the structure of these boats.

CUTTER of the tallies, an officer of the exchequer, who provided wood for the tallies, and cut the sum paid upon them. See TALLY.

CUTTER, in *Mechanics*, is a circular piece of well tempered steel, varying in diameter, from the dimensions of a shilling, to the size of a crown-piece, and having notches cut on its edge generally of the shape of saw-teeth, but sometimes finer, like the indentations of a coarse file; when fixed, by means of a central hole, on the revolving arbor of an engine for cutting the teeth of a wheel, it forms the spaces between the teeth of a breadth equal to its own thickness, and when its sides are flat the space so formed is a small parallelogram, pointing to the centre of the wheel. It is therefore necessary that every engine should have a variety of cutters, differing in thickness as well as shape, to form the teeth of wheels, that require different degrees of strength, and forms adapted to particular purposes. The reader will see in our subjoined account of CUTTING-ENGINE, a reference to the plates in which some of the varieties of cut-

ters may be seen both in a detached state, and also attached to the engine of which they form a constituent part.

CUTTER-GAUGE is a contrivance for ascertaining and expressing the exact thickness of a cutter, such as is described in our preceding article. The workman who is in the constant habit of using a cutting engine will, indeed, generally guess what cutter is proper for any wheel, of which he knows the diameter and number of teeth wanted, particularly when it is of ordinary dimensions; but still it is necessary to verify his conjecture, by a previous partial trial on a piece of useless metal of similar radius, or by marking only with the cutter, or a marking knife, the edge of the wheel itself, till he is satisfied that the teeth and spaces, when cut of the requisite depth, will be reciprocally of due dimensions. To avoid such previous trial, Mr. Robert Hynam of St. Petersburg invented an instrument for gauging and expressing the thickness of cutters, which was laid before the Society of Arts at the Adelphi, and honoured with a reward. [See vol. xvii. of their Transactions, 1799.] The instrument here alluded to manifests considerable ingenuity, but in our opinion is too complex and expensive to become of general use. An ordinary wire-gauge, or plate of steel with notches, having parallel sides of various dimensions, would, we think, be found equally serviceable in practice. The method is simply this; when the wheel is ready for cutting, describe a circle on its plane to represent the pitch-line, more or less distant from its extreme edge, according as the teeth are to be fine or coarse, and measure the diameter of this circle in inches and tenths of an inch, for the practical diameter of the wheel; in the next place, multiply this diameter by 3.1416, or otherwise multiply it by 22, and divide the product by 7, and the inches thus obtained will be the circumference of the pitch-line of the wheel, by which, if the number of teeth proposed for the wheel be divided, the result will be the number of teeth per inch that the wheel is to be cut into; but as there are as many spaces as teeth in every wheel, it must be recollected, that both a tooth and a space go in this calculation for one tooth only; hence, when the teeth and spaces are respectively of equal dimensions, the cutter that makes the space ought to be only one half of the calculated dimensions; that is, a wheel found to be of six inches circumference at the pitch-line, in order to be cut into sixty teeth, or ten per inch, will require a cutter of only one twentieth of an inch thick, to make the tooth and space equal to each other. Suppose now the gauge-plate to have a dozen notches, of $\frac{1}{16}$ th, $\frac{1}{8}$ th, $\frac{1}{4}$ th, &c. up to $\frac{3}{4}$ th of an inch breadth respectively, these notches will be proper gauges for cutters to use for 5, 6, 7, &c. up to 17 teeth per inch, on a supposition that the plane of the cutter is precisely at right angles to the arbor on which it revolves in action; but as it is found in practice, that most cutters, however carefully made, cut notches or spaces broader than the thickness of the cutter, particularly when the cutter has been newly sharpened, it may be a necessary precaution, after the cutter, chosen by the gauge, has formed one space in the wheel, to compare that space with the gauge rather than the cutter itself, as determined by calculation of the wheel's diameter, and requisite number of teeth, taken conjointly. In this way a suitable cutter for any practical number of teeth in a given wheel may be readily determined without previous trial. In those cases, however, where it is deemed desirable to have the teeth larger than the spaces in any wheel, its fellow, or corresponding wheel of the pair, must have its

teeth smaller than the spaces; so that one of the two wheels must be cut with a cutter thicker than a mean cutter and the other with one thinner. We have given a table of diameters in our article *Clock-making*, where the workman will find the various dimensions and corresponding number of teeth per inch already calculated for him, which therefore he may take by inspection, and choose his cutters, accordingly, (as we have there directed in the uses of the table) by the mere help of his gauge-plate, or even without, provided the cutters once gauged were marked agreeably to the number of teeth per inch they have been gauged for; and also provided the original thickness at the cutting part be not altered by the act of sharpening.

CUTTERS, a term with *Miners*, for joints or partings in a vertical direction, or nearly, between the different blocks of coal, as they lie in the seam; these are crossed again, nearly at right angles, by other vertical joints called backs, and these together much facilitate the getting of the coal in a mine.

CUTTERAH, in *Geography*, formerly a town, now a ruined village of Hindoostan, in the country of Oude; remarkable for being the scene of the decisive battle of 1774, in which Sujah Dowlah defeated the Rohillas, by which action the fate of that brave people was determined; for Hafez-Rhanut, their chief, was slain, and our army penetrated their country as far as Loll Dong at the foot of the mountain. This place is now a motley assemblage of ruinous mud houses, not a tenth part of which are inhabited: 20 miles S.S.E. of Bereilly.

CUTTING, a term used in various senses, and various arts; in the general it implies a division or separation.

CUTTING, in *Coinage*. When the laminæ, or plates of the metal, be it gold, silver, or copper, are brought to the thickness of the species to be coined, pieces are cut out of the thickness, and nearly of the weight, of the intended coin; which are now called *planchets*, till the king's image hath been stamped on them.

The instrument wherewith they cut, consists of two pieces of steel, very sharp, and placed over one another; the lower a little hollow, representing a mortar, the other a pestle. The metal put between the two, is cut out in the manner described under *COINAGE*.

Note. Medallions, where the relieve is to be great, are not cut but cast, or moulded.

CUTTING is particularly used in *Heraldry*, where the shield is divided into two equal parts, from right to left, parallel to the horizon, or in the fesse-way.

The word is also applied to the honourable ordinaries, and even to animals and moveables, when they are divided equally the same way: so, however, as that one moiety is colour, the other metal. The ordinaries are said to be *cut*, *couped*, when they do not come full to the extremities of the shield.

CUTTING, in the *Manege*, is when the horse's feet *interfere*; or when with the shoe of one foot he beats off the skin from the joint of another foot.

The part most frequently bruised is the side of the fetlock joint, where the toe of the hoof is turned out, the inner quarters of the shoe or hoof are more frequently the parts that do the mischief; but when the toe is turned in, the injury is done by the anterior part of the shoe. If the toe is turned out, the inner quarter of the crust is most frequently lower than the outer. This condition of the hoof necessarily inclines the fetlock joint of the foot that supports the weight, nearer to

the foot in motion. Farriers, says Mr. Coleman, in his "Observations on the Structure, &c. of the Foot of the Horse" (vol. i.) generally attend to the hoof that cuts, and not to the hoof of the injured leg; but while the leg is in the air, no shoe can alter its direction; and the small quantity of horn, or iron, that can be removed from the hoof and shoe, very rarely prevents cutting. But it is very practicable to alter the position of the leg, that supports the animal; and thus the foot in motion may preserve the same direction without being liable to cut. The outer quarter of the crust should be lowered, and the inner quarter preserved. This operation will tend to make the bottom of the hoof the reverse of its former state, that is, the inside quarter higher than the outside, and this will throw the fetlock joints farther from each other. Where the sole is thin, very little of the crust can be removed from the outside; and thus it will be necessary to attend to the shoe. The inner quarter should be thickened, and the outer quarter made thin, which will produce the same effect, as altering the horn; or, if the hoof be sufficiently strong, both these remedies may be applied at the same time.

When the toe inclines inward, says Mr. White, in his "Compendium of the Veterinary Art" (vol. i.), it renders a horse liable to cut on the inside of the knee, at the lower part of the joint: this is sometimes termed the "speedy cut," from its happening upon the trot or gallop, and is considered as a dangerous failing in a horse:—the pain occasioned by it sometimes causing him to fall very suddenly. The remedy for this is to keep the toe as short as possible, that being the part which inflicts the wound, and to alter the improper position of the foot. Cutting frequently depends upon weakness or fatigue, and is therefore liable to happen to young horses when rode very hard over deep heavy ground. The only remedy in this case is to avoid the cause till the legs acquire more strength, and to protect the wounded part with leather, or a boot, as it is termed. Whenever a horse cuts, it is desirable to ascertain what part it is that inflicts the wound; and this may be often done by applying tar to the wounded part, which of course will adhere to the part of the hoof or shoe that comes in contact with the wound.

CUTTING, in *Surgery*, denotes the operation of extracting the stone out of the bladder by section. See *LITHOTOMY*.

CUTTING-glass, in *Surgery*. See *CUPPING-glass*.

CUTTING-Engine, in *Mechanics*, is the name of an engine, which divides and cuts a wheel, pinion, or rack, into any assigned number of teeth, which office it performs both with accuracy and expedition. While the art of constructing wheel-work was yet in its rude state, the dividing of a wheel into the requisite number of circular parts, and cutting away the notches or spaces by a manual operation with a file, was not only a tedious but an imperfect way of proceeding, which left such inequalities in the size and shape of the tooth, as were but ill suited to transmit any applied force in an equable manner, or to perpetuate the duration of the parts once made. To facilitate such manual operation by a file, the simple platform was invented, described by father Alexander, in his book on clock-making, which was a circular plate of brass, from ten inches to a foot, or more, in diameter, with as many concentric circles thereon, as the usual numbers of teeth in the wheels and pinions of clock-work required to be divided into corresponding parts of a circle. In the centre of this platform was fixed a stem, or fast arbor, round which an alidade, ruler, or index, with a straight edge, pointing to the centre, turned freely into

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any given point of a required circle, by means of which the divisions of any given circle were transferred to a wheel, placed on the said stem under the said index, by a marking point. This mode of dividing a wheel is still imitated by the enamellers and engravers of clock-faces, and is certainly an easy way of transferring divisions from a larger to a smaller circle for various purposes, where the accuracy of an astronomical instrument is not required; but still the spaces were required to be cut by hand with a file; at length a little frame was mounted on the index, which was contrived to direct and confine the file in such a way as to cut the notches of a wheel, placed over the index, with less deviation from the truth than could be managed by mere manual dexterity; this addition, no doubt, led to the adoption of a circular file, or cutter, and of such other appendages as completed the construction of a simple cutting-engine; and it is asserted [“*Etreintes Chronometriques*” par M. le Roy] that Dr. Hook was the first person who contrived such an arrangement, as could merit the name of a cutting-engine, [machine a fendre.] The doctor’s invention, which, like many other of his inventions, has proved to be of permanent and great utility in mechanics, consisted of an entire transmutation of the old stationary platform, with its moveable appendages, into a moveable platform inserted into a strong metallic frame with stationary and additional appendages; the machine thus converted into an engine, or self-acting piece of mechanism, consisted of the strong frame; the sliding supporting bars of the platform, or plate, with an horizontal screw of adjustment for distance from the circular file; the divided plate with a revolving arbor to receive the wheel to be cut; and the alidade fixed to the great frame, in the position of a tangent line to any of the divided circles, and applying its bent and rounded point to the punched marks of division on the circle successively, as the plate revolved, in the act of cutting the successive teeth of a wheel. This construction of the engine is very nearly the same that remains in the tool shops of the present day. The original divisions of the circles, viz. 360, 300, 150, 90, 60, &c. are also retained in the ordinary engines, though many of the smaller numbers are included in the larger ones, and are therefore superfluous; for taking every fourth hole of 360, is the same as using the circle of 90, or every sixth the same as using the circle of 60; also taking every other hole of 300 is the same as using the circle of 150. As these ordinary engines are very limited in their operations, by reason of their powers extending only to the numbers marked on the divided circles; and as the prime numbers are not usually inserted, we find that different ingenious men, both in France and England, have contrived additional apparatus to render the engine more perfect. Indeed so long ago as the year 1716, Henry Sully brought into England, among his collection of new tools, a superb engine, made by M. de la Faudière, which has been mentioned by Julien le Roy, and described by Thiout in his “*Traité d’Horlogerie*.” About 1730, M. Taillemard made further improvements in the cutting-engine, particularly by introducing a tubed arbor instead of an arbor with a square hole, which had been usual before. After Taillemard, his apprentice Hulot continued to construct engines in a superior way in France, and is succeeded by his son Hulot the younger, whose execution is deemed equal to that of his father.

M. Fardoil, another French mechanist, contrived a plate to his engine, which afforded the means of cutting any number of teeth in a wheel, prime or composite, by a circular rack and endless screw, the latter of which is fixed in a stationary position. The description of this engine is

given in Thiout’s work which we have already mentioned, to which the curious reader is referred for a full account. The number of notches on the circumference of the plate, which has no divided circles, is stated to have been 420, so that one revolution of the screw answered to a tooth, where the wheel was required to be cut into 420 teeth, and in proportion as the micrometer-head of the screw was turned more or less than an entire revolution, were the teeth reciprocally fewer or more numerous than 420. This number seems to have been chosen in preference to any other, by reason of the many composite parts it is capable of being divided and subdivided into. In practice it was necessary to divide the number 420, and also the number of teeth of the proposed wheel by some common divisor, in order to reduce the terms into their lowest denomination; then the quotient arising from the number of the wheel’s teeth, in using the common divisor, was made the number for the divisions of the micrometer-head, and the larger quotient coming from the term 420, was the proper number of divisions of the said divided micrometer-head necessary to pass the index after cutting each tooth. An example will render this mode, which was certainly ingenious, intelligible to any ordinary reader, who has seen an engine. Let the number of teeth to be cut be 249, then the common divisor will be 3, and $\frac{420}{3} = 140$, likewise $\frac{249}{3} = 83$; the smaller quotient therefore 83 is the number of divisions proper for the micrometer-head, fixed to the axis of the endless screw, and 140 of those divisions must pass the index after each cutting operation; the result in this case will be the same as if the micrometer had had 249 divisions, and 420 of these had passed the index after the cutting of each tooth. The micrometer-head had a ratchet wheel and contrivance for making number *one* of the divisions come back to its original situation after each operation, like the contrivance in the engine for dividing sextants and nautical circles, which engine will be seen in another place. This mode of cutting all kinds of numbers, ingenious as it is, requires, however, various micrometer-heads to suit such prime number, which prime numbers themselves require dividing previously; consequently the real advantages of this contrivance are by no means adequate to its professions. Berthoud has given a description and drawing of a French machine for cutting the teeth of wheels and pinions, in his “*Essai sur l’Horlogerie*,” and also in his “*Histoire de la Mesure du Temps*,” such as he considers of the best construction; and in his “*Traité des Horloges Marines*,” he has described an apparatus for forming the ends of the teeth by means of a concave file confined in a frame, which makes it move in a given direction; which description, together with the drawing, is copied into his “*Histoire de la Mesure du Temps*.” We satisfy ourselves with a reference to these contrivances, in order to describe two engines of English construction, which have not been previously described, and which, we think, merit a particular notice, both as specimens of ingenuity, and as engines of great utility in daily practice. These engines we have already referred to under our article *CLOCK-MKING*; one as being used by the late Brown of King-street, Seven-Dials, London, which we learn was projected, and partly made between the years 1770 and 1780, by Hindley of York, when in London; and the other, as being contrived by the late Rehé, mechanist to the naval board of works, and purchased by Troughton for the use of a relative, who is since dead, and who is succeeded by James Fayer of No. 35, White Lion-street, Pentonville, who now uses it. On a reference to Mr. Troughton’s books, we find, that his late brother divided Rehé’s engine-plate in

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the year 1783, which fixed the date of its construction; and from this as a model it was, that the inventor constructed a similar one for Dr. Milner, the dean of Carlisle, of the expense of which that gentleman had not formed a competent judgment at the time he gave his order, to make as good an engine as could be constructed, which occasioned some demur about the payment. The worthy dean little suspected that the engine he had ordered would cost him three hundred pounds or guineas; and the reader will not be less surpris'd to be told, that Rehé's engine, with its apparatus, was sold at his sale for 700*l*.

Cutting-Engine by Hindley.

The cutting-engine contriv'd by Hindley is represented in *Plate II. of Engines. Fig. 1.*, is a perspective view of the entire engine in a state proper for cutting, with the exception of the foot-wheel surrounded by the cord that gives motion to the revolving cutter, and of the bench to which that wheel is attached, and on which the engine rests; but the reader who has seen a common turning-frame, or other mechanism turned by the foot, can readily conceive how a similar motion may be given to the cutting-engine by a lever, placed nearly horizontally under foot, and connected with the crank of the large wheel's arbor: *figs. 2 and 3.* shew the cutter frame detached from the engine, the first of which supposes the eye placed over it, and the other at one end when viewing it; we shall speak of them more minutely, and also of some figures in *Plate III.*, when we have described the engine in its entire state.

A B C D E F is a strong iron frame, fixed by the end pieces at E and F to a steady bench, to which also the large wheel for the cord is fast, but not seen in the drawing; the side-pieces of the frame, A B and C D, are exactly parallel to each other, and their upper edges are terminated by two slopes that form an oblong and obtuse wedge, on which the sunk base of the cutter-frame, G H I K, rests, and slides smoothly when one of the handles and micrometer head at L turns the horizontal screw, between B and D, that is tapped into a piece of metal behind the cutter-frame and attached thereto. M is a strong tube of brass fixed to the side of A B by four screws seen to the right and left in the square part to which the tube is fast: within this fixed tube M there is another tube N seen above it, which constitutes the revolving arbor of the large circular plate O, under the frame; the annular shoulder-piece, P, resting on the top of tube M, and pinned or screwed fast to the interior tube N, bears the whole weight of the plate O: a section of these tubes, containing another tube and arbor of a pinion to be cut, is given in *fig. 1. of Plate II.* The plate, O, is about a foot in diameter, and marked into a number of divided circles, with holes drilled through at each divided point, the use of which will be explained presently. Through the inner tube N, or axis of the plate O, passes a solid arbor on which the plate, Q, is fixed, with a few notches cut on one side; this solid arbor is fixed by a screw, under the centre of the plate O, as seen in *fig. 1. Plate II.*, and may be taken out at pleasure, and a projecting pin fixed in this solid arbor, below the wheel, takes into a corresponding notch made in the tube N, which contrivance makes the solid arbor and tube, N, rest or revolve together, as circumstances require, and also along with them the circular piece of metal Q, placed fast to the solid arbor by a collet and tapped nut screwing down upon the superior end of the arbor, formed into a screw, as seen in the figure. Of these solid arbors there is a variety belonging to the engine, with their superior ends varying in thickness to suit the different holes of different plates Q, or in other words, to suit the central

holes of different wheels previously turned and fitted to their respective arbors; but it is not necessary to introduce those different arbors into our drawing, as their shape is common, and their dimensions vary only at the superior end, where the wheel fits. In consequence of the connection of the solid innermost arbor with the tube N attached to the platform or divided plate O, whenever this plate revolves a given quantity, or division of one of its circles, the wheel fixed to the solid arbor, above the frame, moves with it precisely the same portion of a circle, and presents itself to the cutter or revolving circular saw R, borne by the moveable frame G H I K, and having a small pulley round the posterior end of its arbor, which is seen embraced by the cord that puts it in motion. Whenever the handle S, attached to the cutter-frame, as may be seen more clearly in *fig. 2.*, is lowered by hand, the cutter, R, descends with it till meeting with the edge of the plate, or wheel Q, it cuts a notch through it, while the moving pulley gives motion to the said cutter; as soon as this notch is cut, the depth of which is regulated by the screw of the handle L, that moves the whole cutter-frame, the handle, S, is permitted to ascend, which it does by means of a spiral spring seen in the middle of the cutter-frame pressing under the top portion in *fig. 2.*; the cutter is then free from the notch of Q, and the latter is at liberty to advance round whenever the plate, O, is moved; during this time an index, with a fixing point, T, called by the French an alidade, holds the plate in a firm position, in consequence of the point, T, penetrating one of the drilled holes of the divided circle, made choice of for the operation; this point, T, is next raised by the right thumb pressing on its opposite end at U, while the fingers of the same hand turn the plate, the space of one division or more as may be required; the left hand in the mean time grasping the handle S, and the foot continuing to turn the large wheel, that is the first mover; the motion of the large plate has now brought Q, the wheel to be cut, a corresponding space round, to the situation required for cutting another notch, which the cutter immediately does on being brought down by S, the handle for the left hand, into contact; the operation of raising the fixing point T, and of moving the large plate O, another division, is repeated, and the wheel, Q, is again in a situation to have its third notch cut; and thus the operations of moving the large plate and lowering the revolving cutter are alternately repeated till there are as many notches cut in the edge of the wheel, as the divided circle contains drilled holes of division, provided the plate is turned only the space of a single division; but when the plate is moved two divisions of the circle every time the point, T, is raised, then the number of notches cut in the wheel will be only half the number of such divisions; so that any divided circle on the plate will serve for a wheel that is either the whole number, or any exact aliquot part of that number. For the ordinary engine this description would have been sufficient to have conveyed to the reader an adequate idea of the operation of cutting a wheel fit for all common purposes; but the engine before us is comprehensive in its uses, and takes in all numbers prime and composite, whether divided on the plate or not, which lie under 360, its greatest number of divisions in one circle; nay, it will go even beyond this number if found necessary, as will appear from a little closer inspection. In an ordinary engine, the fixing-index, or alidade, is made elastic, and placed on the side of the principal frame, and is moveable on the end opposite to the fixing point, so as to be capable of being placed as a tangent line to any one of the divided circles, but has no screw or micrometer to alter its length or position when once fixed, on which account a wheel cannot be cut into any other number of teeth, but

such

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such as are laid down on the plate, or such as are derived from those, by taking every second, third, or fourth, &c. hole of the divisions; whereas in the engine before us the fixing index, U T, is not attached to the frame, but to the four-armed piece of brass V W X Y, that is moveable round the inferior end of the fixed tube M at V, and connected with a worm-screw by means of teeth cut on its branch Y, as shewn in the figure; the worm near Y is fixed by a cock to the end-piece E of the large frame, and has a micrometer head, Z, divided into sixty notches, instead of dividing lines, that the elastic index *f*, above Z, seen screwed to the said end-piece of the frame, may make such a noise in passing the said notches of the micrometer-head as are audible to the workman, who therefore has no need to examine the dividing marks by the eye in the act of cutting. The branch, X, has an oblong hole in it, that the contiguous end of branch Y may be adjusted in it, by fixing the racked end near Y in a proper situation to act freely with the worm screw when wanted; the piece of brass *a*, with a long open in the middle, and screwed at *g* to the side, A B, of the principal frame, has the screw, *d*, passing through it to fix the branch X, whenever the worm-screw is not required to be in use, which in this case fixes the index, T U, to the frame A B, but when the worm is used, as hereafter described, the thumb-screw, *d*, is turned back. The arm W b, to which the index and fixing point, T, are attached, slides, in the adjustment for a given circle to be used on the plate O, along an under bar of similar dimensions, which it covers, and which is a part of V continued; the interior end of W b is kept to its direction by the fixed clamp, *b*, that moves on pivots near the letter *b*, at one side, and has a fixing point that penetrates the holes of division made and numbered, along the upper or sliding bar, with figures that indicate the divisions of any given circle to which the fixing point, T, of the fixing index is at any time placed; therefore, when a wheel is required to be cut into any number of teeth, found upon the divided bar W b, this bar is slid in or out, while the fixing point of clamp *b* is held up, till the hole designated by the required number falls under the said point, in which situation it is made fast by the thumb-screw *e*, and the point, T, then falls into one of the drilled holes of the proper circle of plate O, which in ordinary engines contains the numbers itself. The index, T U, of the fixing point of the plate O, turns on pivots above *b* when pressed by the thumb at U, and has a spring underneath that makes it return, and holds it fast in any assigned hole of a given circle of the plate during the cutting of a space in the wheel required to be cut; but when the plate is wanted to be at liberty to move a large portion of a revolution for any purpose, the spring just mentioned can be locked, so as to hold the point, T, above the plane of the plate, till the act of cutting commences. By the help of this appendage to the engine a wheel may be cut into a number of teeth not divided on the plate in the following manner; suppose a wheel of 62 teeth were required to be cut, and that there were no divided circle on the plate nearer than one divided into 60 holes, to cut it from; then having fixed the wheel on the solid arbor by the fixing nut, in the situation of Q, and having slid the divided bar W b till the fixing point of *b* falls into the hole designated by 60 on the said bar, let it be fixed there by the thumb-screw *e*, and let the point T fall into any one of the holes drilled in the circle 60, which will now be exactly under it; also let the thumb-screw *d* be turned back to set the four-armed piece at liberty to move by the worm-screw Y attached to the micrometer-head Z; in this situation of the apparatus cut a notch in the wheel, then press on the end U of the index and carry the plate in the direction from O towards T, the quantity of two divisions,

which will be two teeth in the wheel if they were cut, the cutter in the mean time being raised from the wheel, as in the drawing; turn in the next place the micrometer screw, and count the turns and parts of the micrometer until the wheel is brought back to its original situation; that is, till the cutter on trial is found to drop easily into the notch before cut without rubbing on one edge of the notch more than on the other. Let the turns of the micrometer thus counted be 7, and 14 notches or marks out of 60 over, for the measure of two teeth in case 60 teeth had been the number to be cut, which will be 434 notches on the micrometer-head passed over by the index *f*; then if these notches be divided by 62, the teeth to be cut there will be $\frac{434}{62} = 7$, for the number of notches that the large plate O ought to be turned back after each tooth is cut, in a direction opposite to that of the plate's motion, when made to revolve after the fixing point, T, is raised; the process therefore now to be used in cutting, is to raise the point T in the first place, then to move the plate from O towards T, one division or $\frac{1}{60}$ of the circle, after that to turn the micrometer back 7 notches of the 60, which carries the plate back again from T towards O, a small quantity, so as to form a tooth of $\frac{1}{62}$ instead of $\frac{1}{60}$, of the whole number to be cut. Lastly, let the notch be cut, and repeat the same process at every cutting, and it will be found at last that a wheel of 62 teeth has been cut instead of one of 60, on account of there being 62 times 7 notches in the 434, that have in the whole passed the index *f*, during the time that the wheel has been under the act of cutting. Should it happen, as will generally indeed be the case, that there is a remainder in the division of the notches by the teeth of the wheel to be cut, the remaining numbers may be intercalated thus: as a second example, let the number of teeth be 61 to be cut from the same circle of 60, and let the turns of the micrometer, as before, be 3, with 37 notches over, out of 60, for the space of a single division on the plate O; in this case there will be only 217 or half the former number of notches in the whole, to be divided by 61, the quotient arising from which is three, with a remainder of $\frac{3}{61}$, so that, properly speaking, $3\frac{3}{61}$ notches of the micrometer ought to be drawn back after every shifting of the fixing point T, but this is not practicable without a ratchet, and returning back to the micrometer, which the engine has not got; therefore as 34 is only 3 more than half of 61, and as one notch on the micrometer does not affect the motion of the plate O in a sensible manner, the notches may be taken alternately 3 and 4 in succession, except in three equidistant points of the wheel, where 4 may be taken twice in succession, which mode of interpolation of the notches belonging to the remainder, as they accumulate, may be practised with any other numbers, and the difference thus occasioned among the teeth will not be sensible even under a magnifying glass. The writer of the present article has seen and examined a wheel of 126 teeth cut from a circle of only 100 divisions in this manner, which appeared as evenly divided, as if it had been cut from a circle drilled or punched into 126 divisions.

If the number of teeth to be cut had been taken fewer than the divisions in the circle used on the plate, the micrometer-head must, in that case, have been turned the contrary way, to augment the divided spaces of the plate, and to enlarge the size of the teeth in proportion as their number is decreased, which effect can now be readily apprehended without further detail.

But this property of being capable of cutting wheels into all assigned practical numbers of teeth, is not the only advantage that this engine possesses over the common engines seen in the tool-shops: when the cutters of these engines require

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require to be changed, the arbor, on the middle of which they are fixed, requires to be taken out of its frame, and to be replaced and adjusted to the centre of the plate, or middle of the solid arbor, as frequently, which is troublesome: also as the cutter-arbor revolves round stationary pivot-holes, the bottom of each notch cut in a wheel is necessarily a portion of the circumference of a circle, which in a thick wheel requires to be filed into a straight line after the cutting is finished. Both these inconveniences are obviated in our present engine. To avoid the first inconvenience, the cutter, R, is put on the projecting end of its arbor, and can be taken off and put on without displacing the arbor from its moveable frame. When, however, the cutters vary in thickness, they require an adjustment of their middle part to the middle of the solid arbor that bears the wheel to be cut, which is done by a contrivance seen best in *fig. 2*; where R, as before, is the cutter, and H I an arbor, round the pivots of which the top of the frame, to which the handle, S, is attached, revolves, and, to which the said top is united by a small handle *i*; when the screws, *k* and *l*, are loose, the top of the frame, *k l m n*, is at liberty to have a motion in the direction from H to I, or the contrary; but the small handle, *i*, is screwed at the middle to the arbor H I, and at the interior end to the top of the frame, near the fork of the large handle S; so that, as the bearing parts H and I, beyond the two ends of the arbor, have no lateral motion, whenever the screws, *k* and *l*, are loose, and the end, *i*, of the small handle is moved towards H, the whole top, *k l m n*, and cutter, R, are carried towards I, and the contrary when the end, *i*, of the small handle is moved towards I; this side motion of the cutter, and of its arbor, affords the ready means of adjustment for cutting the spaces, and consequently of forming the teeth of any wheel with a given cutter, in a direction tending exactly to the centre of the said wheel; and when the adjustment is made, and examined by the notch in gauge *p*, *fig. 1*, which ought to fall on the middle of the cutter, when turned round its centre of motion at its lower extremity, the tightening screws, *k* and *l*, may be turned home again, and the cutter will remain adjusted. With respect to the other advantage of cutting the bottom of each space in a straight line, however thick the required wheel may be, *fig. 3* will furnish an explanation; here is a side view of the cutter seen less obliquely than in *fig. 1*, and detached from the other mechanism; H, as before, is the place, where the proper centre of motion of the arbor H I, in *fig. 2*, is, and R again is the cutter; the arbor of the cutter is hid, but can easily be apprehended to be admitted to pass up and down the opening *s*, of the part, K, of the frame, as seen in *fig. 1*; while a roller or friction-wheel, surrounding the said arbor, touches the interior sides of the fork *s t*; this property of the cutter's ascending and descending in a straight line, when the handle, *s*, is raised or lowered, would however be checked by the limit of distance from R, the centre of the cutter, to H, the centre of motion; but the pieces, H and I, have also each a centre of motion at their lower extremities, as at *r*, which allow the centre H, and its corresponding one at I, to approach to, and recede from, the oblong aperture, *s*, twice in each ascent and descent of the cutter; namely, once above its present horizontal position, and once below. The perpendicular screw at *u*, forms a stop to the ascent of the arbor, and a corresponding one below at *r*, forms a similar stop to its descent; the latter of which is also used as a limit for the depth of a contract wheel's teeth, during the operation of cutting. When a very large wheel is to be cut, there is a part of the cutter frame behind G, not seen, which is tapped, to receive the screw of the handle L, in

fig. 1, one half of which tapped piece is cut away, and allows the other semicircular part to be set at liberty from the screw, by turning on a hinge, to enable the frame to slide freely to the rough distance, without turning the screw, which contributes to expedition in the adjustment of the cutter's distance from the solid arbor that bears the wheel. In common engines it may be proper just to mention the large plate O, together with its secondary frame that supports its lower pivot, is adjusted by the horizontal screw to the cutter, the frame of which cutter remains always fixed to the principal frame.

Besides the parts above described, the engine before us has got two appendages, that render its uses still more comprehensive, namely, a contrivance for cutting pinions on the arbor, and an apparatus for cutting straight racks, with which we will finish our account of this engine.

Fig. 1. of Plate III. (of ENGINES), is an elevation of the appendage for holding a pinion on its arbor, together with a section of the concentric tubes above the large plate referred to above, but not seen. In *fig. 1. of Plate II.* A B is a portion of the principal frame, denoted by the same letters as before, M and N, a section of the fixed tube M. In *fig. 1. of Plate II.*, N and N, a section of the revolving tube N, or axis of the plate, P and P, its bearing shoulder, and Q R, a third tube, instead of the solid arbor, holding the pinion arbor fast, and fixed by the milled nut, R, under the plate O, seen now as a straight line: the stage of the innermost tube at Q, has many holes drilled into it, tapped so that not only a pinion, but a wheel also, may be attached to it, and cut, after it is fast to its arbor; of these tubes, Q, R, there are many varieties, differing in bore and size of the stage, to suit different purposes. The piece *a b*, attached to the frame A B, by two screws at *a*, has an oblong opening, receiving the sliding piece *c*, that can be fixed by a thumb-screw behind, at any height, and that admits the horizontal bar *d*, to slide through it, before it is fixed; at the part *e*, of *a b*, is a hole with a slit, that allows it to open or close by the action of the screw *f*; through this hole *e*, the steel wire, *g*, passes, and forms a bearing for the upper pivot of the arbor, *p*, of the pinion, which otherwise would yield to the cutter, while the bar *d*, pressing against the said arbor near the pinion, prevents its bending during the operation of being cut, or *slit*, as this operation is usually called, which is performed like the cutting of a wheel, already described.

Fig. 2. of Plate III. is a plan of the upper side of a small plate of brass, and of its appendages, for holding a rack during the act of cutting, and for limiting the size of the teeth to any given dimensions; *a b*, is the plate in question, mounted over the frame of the engine, near the cutter, by means of a strong bar, like *a b*, in *fig. 1*, and placed in the same situation, as may be seen in *fig. 3*, which is an end view of *fig. 2*; the two little screw-holes at each side of the letter *b*, in *fig. 2*, shew the place of attachment; and a strong screw, passing through the larger hole at *c*, enters the superior end of the main arbor of the engine plate, and fixes this mechanism steady enough to bear the action of the cutter, applied in the usual way. The bar to be cut into a straight rack lies upon this plate *a b*, from *d* to *e*, between the cocks *d* and *e*, on one side, and the adjustable bar *f*, on the other, which bar sliding in the two oblong openings, may be fixed at the required distance from the said cocks, by means of the two screws at its opposite ends taking into two nuts, beneath, while a couple of thumb-screws *g, h*, seen in *fig. 4*, which is a side view, press above the said bar intended for the rack, and keep it firmly down. The pinion *i*, with twenty teeth, is used as the head of a micro-

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meter serew, which the elastic index, *k*, rests upon, so as to make an audible sound, to serve as a reporter of each twentieth part of a revolution; it is seen in the *figs.* 2, 3, and 5, the last of which is the plane of the inferior side of the plate *ab*, and without which the whole contrivance could not well be explained in an intelligible manner: on the arbor of the pinion, *i*, is an endless serew or worm, seen in *fig.* 5, into the spiral space of which a single tooth, *l*, is inserted; the bar, *l*, which is seen pressing against the cock *e*, as a thin bar in *fig.* 2, has a joint near the pinion *i*, on which the catch, *m*, turns, when lifted by the lever *n*, which lever itself turns on a pin in the bar *l*, as a fulcrum. The catch *m*, as represented in *figs.* 2 and 5, is raised a little from the bar *l*, and has a spring, attached to the bar *l*, pressing it back again into contact with this bar; consequently the end, *n*, of the lever is now nearer to the pinion, *i*, than it would be, if the end, *m*, of the catch were not removed, in opposition to its spring, from the excavated part of the plate. The catch, *m*, which is seen covering the bar, *l*, in the side view in *fig.* 4, has an oblong opening, through which the fixing thumb-serew, *o*, passes, as well as through an opening in *l*, not seen, into the cock *e*, in *fig.* 2; and the bar, *l*, is itself attached to the plate by a sliding cock *p*, in *fig.* 5, and also by a dove-tailed piece attached to the cock *e*, in *fig.* 2, on which piece the concealed dove-tailed opening of *l* slides, when the worm is in motion. From this detail of the different parts of action, it may now be conceived, that when the pinion, *i*, is turned, its worm actuates the single tooth attached to the bar *l*, and consequently moves this bar, together with the lever *n*, and catch *m*, a quantity in or out, that depends on the direction and quantity of the pinion's revolution, after which motion, it may be fixed to the cock *e* of the plate, by the fixing serew *o*; and as the edge of this cock *e* is divided into inches and tenths, a stroke made on the contiguous edge of the bar, *l*, serves as an index to measure the tenths passed over; the thread of the worm-serew is so cut, that one revolution of the pinion draws the bar *l*, and its appendages, just one-tenth of an inch; consequently, one tooth of the said pinion, counted by the noise of the elastic index *k*, measures $\frac{1}{20}$ of $\frac{1}{10}$, or $\frac{1}{200}$ of an inch. As the same letters of reference apply to all the four *figs.* 2, 3, 4, and 5, a further description, it is presumed, is unnecessary. In using this apparatus, the cutter-frame of the engine is adjusted so, that the cutter intended to be used is brought into contact with the edge of the bar to be cut, at the excavation near the end, *m*, of the catch, and is made to cut a notch, as though a wheel were to be cut; the cutter is then raised out of the notch thus cut to a proper depth, and the pinion, *i*, is turned, so as to make the end, *m*, of the catch fall into and till the said notch, the rack being in the mean time pressed fast by the serews *g* and *h*, seen in *fig.* 4; the lever, *n*, is then depressed, which takes the catch, *m*, out of the notch; and supposing $\frac{1}{5}$ of an inch to be the thickness of the tooth to be cut, the pinion is turned back again two entire revolutions, one for the space, and the other for the tooth, in which new situation the bar, *l*, is set fast, by the fixing serew *o*; the rack is now set at liberty, by turning back the pressing serews *g* and *h*, and the rack is moved gently by hand, towards the pinion *i*, until the catch *m*, in its adjusted and fixed situation, falls again, by means of its spring, into the same notch which it occupied before it was moved by the worm-serew; the rack is a second time pressed by the serews *g* and *h*, and a second notch is cut as before, which now forms the tooth of a requisite thickness; again the catch, *m*, is lifted by the lever *n*, the rack set at liberty, and moved till the second notch is

caught by the catch, where it is in a situation to be fixed for the cutting of the third notch, or second tooth; and thus the alternate process of raising the catch, and moving the bar of the rack, till it is caught in the next succeeding notch, is repeated before each cutting, till as many teeth are cut as are wanted; the pinion and its worm serew having performed their whole office before the second notch was cut. When the rack is required to be cut into teeth on nearly its whole length, it is usual to begin about the middle, and to cut one half first, and then to reverse for the other half, and begin again from the notch first cut, which mode of operation requires not only the ends of the rack, but the surfaces also, to be reversed, after the first half of the work is performed.

On the plate of this engine there are thirty divided circles, with the points of division drilled quite through; numbered thus; 365, 360, 144, 100, 60, 30, 96, 90, 80, 78, 72, 54, 48, 62, 54, 92, 64, 59, 86, 88, 84, 82, 76, 74, 70, 68, 58, 56, 52, and 49, which divisions include all the usual numbers introduced in the wheels of clock-work; and such as are not found here may be obtained by the help of the micrometer, when wanted for planetary motions, or other extraordinary purposes.

Cutting Engine by Rehe.

Plate IV. of Engines exhibits a general perspective view of the engine for cutting the teeth of wheels, as originally made by Rehe for his own use, and which, we have said before, is now the property of Mr. Troughton of Fleetstreet. It is drawn to one-fourth of the real size. AABCDE is one solid mass of cast-iron, formed into a frame in the mould, of which AA is the upper horizontal part, B and C the ends of the said frame, and DE its base, fixed with four strong serews (the heads of which are visible) to a wooden frame, to which the large wheel is appended, that gives motion to the revolving cutter and some intermediate pullies placed over the head to give a due direction to the moving cord: this large wheel and these pullies are purposely omitted in the drawing to give room for the engine itself to be taken on a good scale. F and G are a pair of cheeks forming a part of HI, which is another piece of cast-iron of the shape of a parallelogram, having an oblong aperture through the greatest part of its length, along the middle. KL is the platform, or large plate, of the engine, in which are drilled the dividing holes of a variety of circles; its diameter is nineteen inches; the arbor of this plate is a strong brass tube, MN, resting in a hole on the base, DE, of the large frame, and having a serew formed on its circumference at N, with a corresponding tapped nut, that has got a handle to turn it by; it has also a slit cut through it to admit a wedge under the nut, as may be seen without further description; the upper part of the arbor is supported by a hole in the top part of the frame AA, and passes freely through the oblong aperture of HI. The tubed arbor, MN, of the large plate will receive a variety of arbors successively, each of which has a slit to receive the wedge already named, near N, while the nut N, turned firmly down on the wedge, sets the interior arbor, that carries the wheel to be cut, fast at the shoulder O, on below its superior end. The interior arbor is, however, composed of two pieces, of which the upper part bears the wheel and is serewed fast into the lower part between M and O. There is a great variety of the upper parts of the interior arbor to suit different central holes of different wheels, as well as different shoulders, or resting places, for the wheels to lie upon in a steady manner, all which

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would take several plates to represent, but may be easily conceived to be only different sizes and shapes of the same thing; it may, notwithstanding, be right just to remark, respecting these bearing pieces of the arbor, that the centering of the wheel does not depend on the screw part that enters the concealed arbor, but on a circular bed, M, made at the top of the lower half of the arbor, which a corresponding circular piece of metal of the upper half, under the bearing shoulder that holds the wheel, near O, exactly fits, by which means the wheel is certain to be placed in the centre of the large plate, which is an essential condition. The wheel, which is seen with a few notches cut, is fastened by a collet pressed down on its plane, by a tapped nut screwed from above the arbor. P Q is a brass frame, embracing the solid cheeks G and F, and bearing the cutter and its arbor R, that has got a pulley on its posterior end, round which the cord of the first mover goes, and to which it gives the motion at first produced by the foot; when the cutter is taken out to be changed, the end piece S, and a circular piece concealed at the opposite pivot of the cutter arbor, are set at liberty, by the tightening screws, T and T, being turned back *pro tempore*; a plan and side view of one of the cutters, of which there is a great variety of sizes and shapes, may be seen in *fig. 2*, of *Plate VI.*, and the arbor dismounted and separated into its parts in *fig. 5*, of *Plate V.*, of one half its real size, both which may be understood by inspection of the figures, in the latter of which *a* is the pulley on the end of the arbor, *b* the part where the cutter is fixed by pressure of the tubed part *e*, urged by the nut *f*, when screwed home. When the hand U, in *Plate IV.*, is turned, which has a pinion on its arbor taking into a straight rack, fixed to the part embracing the cheek C, out of sight, the whole brass frame has a motion, up or down, as the handle may direct, which is always given it in the operation of cutting each notch. This motion of the whole cutter frame is made easy and smooth by eight sectoral pieces of hard polished steel acting as friction wheels against parallel bars, attached to the cheeks, both within and without the said cheeks; of these sectoral pieces 1, 2, 3, and 4 are seen, but the others, placed in their opposite and corresponding places, are concealed from the view, by the intervening parts of the mechanism. Behind Q, on the posterior part of the cutter frame, is a box containing a spring, with a chain fixed at its lower end to a piece of metal, not seen, between the cheeks and behind the cutter frame, which spring balances the weight of the frame in any position, and renders the working pleasant. Near the character 3 is a perpendicular screw seen, the lower end of which bears against a solid piece fixed between the cheeks, when the frame is lowered so much that the cutter is free from the wheel it is cutting; which screw is also the part of adjustment for the exact depth of a space in a conuate wheel, while the barrel and chain limit the ascent. The whole of this cutter frame is attached to the horizontal parallelogram HI, and is moved to or from the wheel to be cut, by a horizontal screw on the arbor of handle V, which enters a tapped part of the metal under the cutter frame, and when the due distance for making the teeth of a proper depth is ascertained, the whole of the moveable part of the engine is fixed fast in its given position, by the clamping piece W, and crossed nut, that takes the screw on the upper end of a bolt, passing up from below the top, A A, of the large fixed frame; the clamping piece, W, has a dove-tailed projection under it, that enters and fills the breadth of the oblong aperture of HI, and

keeps the piece at right angles thereto. X is the fixing index, or index-bar with a fixing point, that holds the large plate in a given position: this index-bar slides into an octagonal socket Y, to which it is firmly fixed, when necessary, by the thumb-screw seen under it; and near Y is a micrometer head divided into 30 divisions, for which a pin behind it forms an index; by means of this micrometer screw the fixing index can be made to protrude, or retire, any given small quantity, and when its fixing point rests in one of the drilled holes of the large plate, it consequently takes the plate along with it, and also the wheel fixed at the top of the plate's solid arbor. The socket Y has another octagonal hole at right angles to the former one, which enables it to slide along the octagonal axis Z, so that the fixing point of X may approach to or recede from the centre of the plate, and be made to fall into any given divided circle; the numbers of each circle are laid down on the small oblong plate *a*, for which a line on the moving socket, Y, forms an index. This part of the apparatus belonging to the plate would have been sufficient, if the operator were to take the trouble of counting the holes of division on the plate as he turns it in the act of cutting; but in those cases where every second, third, or fourth, &c. hole only is taken by the fixing point, in order to cut a wheel into one half, one third, one fourth, &c. part of the number laid down in any circle, such counting is very troublesome; therefore a curious addition of a moving index *b*, *c* is introduced to be a substitute for the counting. This index turns on the arbor of the large plate, and has a sliding point and thumb-screw *e*, to fix it in any given hole of the circle chosen for the fixing point of X to rest in: *d e* is a sliding stop, passing through a cock fixed to the part, A A, of the principal frame, and is held in any given situation by the thumb-screw over it; and *f g* is another stop attached to a second cock, fixed in like manner to A A; which second stop can be placed in various positions, by means of its own slit and two thumb-screws, and also of the two slits in the cock at right angles to the length of the stop. The use of the moving index is this; when the fixing point of X is fast in its proper hole of any given circle, the moving index is brought so near to it, that its point will fall into the next contiguous, or second next hole, in which situation the inner stop, *d e*, is brought to bear against it and fixed, then the moving index, *b c*, is removed back over two, three, four, or as many holes as are to be counted at each act of cutting a notch of the wheel, from the index X, and is put into the hole so counted, in which situation the outer stop, *f g*, is brought to bear against it and made fast; now it is easy to conceive, that if one hand were to raise the fixing index, X, out of its hole, whilst the other hand were to bring the moving index together with the large plate into which it is inserted, until it meets with the inner stop *d e*, the point of X would then cover the hole counted, into which it might be permitted to fall at random, and it would find its own proper hole under it; then raising the moving index from its hole, and moving it to the outer stop, would place it over the hole to be next counted, into which it might also fall at random. Thus the operation might be repeated all round any given circle, while the stops would act as counters, and the moving index as a handle to move the plate by; but this mode of using the indices would occupy both the hands of the operator, and would require a second person to turn the handle U, and to attend to the cutter; an appendage therefore to the moving index is added, which connects the

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the moving with the fixing index in such a way, that one hand is competent to manage the whole operation even without the eye being directed to the part, after the stops are properly set, and the indices adjusted; thus, at the part *b* of the moving index is a milled head, like a thumb-screw in appearance, placed on the perpendicular small rod *k*, that passes through this index freely, and attached to a lever *i*, that is moveable on a pin or centre of motion, at the inferior end of the cock *k*, placed fast to the moving index; this lever, *i*, passes on, beyond its centre of motion, till it meets with a long lever under the plate, lying in the direction of the dotted lines passing by *K* on the plate; this second or long lever is fast to the octagonal axis of socket *Y*, which, it has been said, is also the axis of motion of the fixing index *X*; it is easy then to see, that, when lever *i* lies under the lever of the axis *Z*, pushing down the milled head, *b*, over the moving index, will raise the fixing index out of its hole, on the large plate, and set the plate at liberty to move; and also when the said milled head, *b*, is quitted, the fixing index will fall again into the hole that may happen to be under it, and will be kept close by the screw *l*, pressing the long lever down by the intervention of the pin *m*, at its extreme end; all therefore that is necessary to be observed in moving the plate, after the indices and stops are properly adjusted, is, to press with the thumb of the left hand on the nut *b*, before the moving index is carried forwards with the plate, and to let it go before the said index is made to return without the plate, for an attention to this particular raises and lowers the fixing index alternately in the way, and at the times required. When however a wheel is required to be cut into a number of teeth, not to be obtained from one of the divided circles alone, another operation becomes necessary, to take or give a tooth or teeth to complete the number desired; this is done by the micrometer head of the socket, *Y*, of the fixing index, which will push the index out, or draw it in, any small assignable quantity, and will consequently push on or draw back the whole plate a corresponding quantity, provided the micrometer be turned when the fixing point of *X* is in its hole of the divided circle that is used; when this operation is necessary at the cutting of every tooth, the moving index does not fall into a hole, but gradually advances to, or recedes from, its original situation, till it arrives at the next contiguous hole, when one tooth only is to be added or subtracted: but when more than one are required to complete the required number of teeth, the point of the moving index will gradually pass over as many divided spaces of the plate, from its original situation, as there are teeth required to be added or subtracted; so that, if four teeth are to be gained or lost by means of the micrometer, the moving point will traverse one divided space of the plate during the cutting of each quarter of the wheel, and in the same proportion for any other number to be taken or given; whence, at any period, during the act of cutting a wheel into a number not inserted on the plate, it may be seen by inspection of the moving point, at what rate the gain or loss is proceeding upon, which indication forms a good check upon the original calculation by which the micrometer is guided. This advantage, arising from the point of the moving index having a progress or regress over the supplementary divisions, is the more desirable in this engine; because, the fixing index which ought to be always a tangent to the divided circle used, and to have its point at a right angle to the central arbor of the plate, does not preserve the latter condition rigidly, when pushed out or drawn in; which deviation renders the reading of the micrometer in practice, less accurate than

the theory supposes; an objection from which the more complex mechanism of Hindley's engine is free. When a wheel of 142 teeth was cut on our present engine, in our presence, from a divided circle of 140, nineteen turns of the micrometer were found equal to a motion of two divided spaces, as compared with the moving point, when left stationary against the outer stop: therefore, as there are 30 divisions on the micrometer head at *Y*; 19×30 , or 570, were the whole divisions to be divided by the number 142, and gave a quotient of 4, with a remainder of $\frac{2}{7}$; consequently, after every moving of the plate for a new cutting, four divisions of the micrometer head were turned in a backward direction, to lessen the size of the teeth, and to increase their number in the proportion 142:140; but at two opposite points of the wheel, the remaining two were interpolated, by giving five divisions instead of four at each place; the additional division on the micrometer, however, made at each of the said two places, made no sensible difference in the size of those teeth, nor would it have been of any importance, if the remainder, which was so small, had been neglected altogether. A similar process, as explained more fully in our account of Hindley's engine, must be adopted agreeably to a similar calculation, for any other number of teeth to be taken in or left out by the aid of the micrometer. The original circles of the large plate were divided by Troughton's dividing-engine into the following numbers, *viz.* 720, 580, 504, 396, 365, 364, 300, 276, 228, 192, 186, 170, 162, 156, 140, 128, and 118; to which have been since added, at different times, the numbers 274, 260, 206, 148, 136, 130, 111, 103, 101, 87, 83, 74, 65, 47, 43, 41, and 37, so that, by this engine, all numbers under 100 can be cut without the help of the micrometer, except 97, 95, 89, 88, 79, 77, 61, 53, and 49.

When our present engine is used to cut pinions on their arbors, a steel perpendicular bar descends from a beam in the room directly over the centre of the plate, and holds the upper end of the arbor steady, while the lower end is made fast to the revolving arbor. There are also many other useful appendages to the engine, some of which merit a particular description and corresponding drawings, which we have obtained.

Fig. 1, of Plate V. is a detached cutter frame of one-fourth of the real size, to be used occasionally when a wheel is wanted to act with a worm-screw, in which case the teeth are required to be a little inclined from the axis to the right or left, accordingly as the screw is a right or left-handed screw. When this cutter frame is used, it is attached to the cheeks *G, F*, in *Plate IV.*, without disturbing the frame already attached. *A B* is a strong brass plate with two forked pieces, *C, D*, projecting back from its posterior plane near the top; these forks enter over the sliding frame *S Q*, in *Plate IV.*, and embrace the two tapped studs *n* and *p* not seen, within the cheek, by which they are held fast when pressed by the tapped nuts of the said studs; at *A*, the bottom of the plate *A B*, in *fig. 1, of Plate V.*, is a screw which enters the small tapped hole, near *I*, on the sliding piece *H I*, in *Plate IV.*, and a corresponding screw at the other side, out of sight, holds the fourth or concealed corner of the said plate *A B*, so that this plate, when thus attached, may be considered as a part of *H I*, in *Plate IV.*, behind which additional plate the common cutter frame is concealed, and remains useless for the time. *E F* is a second plate of brass of nearly a semicircular shape and graduated on its periphery; this second plate is attached to the former one, *A B*, by two tapped bolts passing through the long opening *G*, and made fast with nuts at *E* and *F*, by which

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means this second plate can be placed at any given height on A B, and a motion, which it has round E, as a centre, allows of its being placed to any angle of obliquity marked on its periphery; the circular slit at E, allowing the upper or fixing bolt to pass along it to any required position, before it is fixed by the nut: the cutter frame, H I K L, moves on pivots in the feet of E F, near A and K, which pivots are turned out of an horizontal line to the right or left, by the obliquity given to the plate E F, and consequently the cutter arbor, L I, has also an obliquity, which makes the cutter at the middle of it cut the notches in an oblique direction; this cutter, however, having but one centre of motion, or rather one pair of centres, cuts the bottom of the notches of a wheel in a circular direction. The arbor of the cutter has a pulley which gives it motion, and the two pulleys, *a* and *b*, over it have no other use, but to direct the cord to the larger distant pulleys, not shewn in the drawing. When the plate, E F, is adjusted to zero, or horizontal line, it may be used for cutting ordinary wheels, but is liable to be displaced by accident or jerks in cutting; therefore is used only for wheels with oblique teeth. The French engine recommended by Berthoud, as made by Hugot has, notwithstanding, no other cutter frame but that which is adjustable for obliquity. The vertical screw, *d*, is a rest for limiting the depth of the spaces of contrate wheels in cutting, and also for stopping the descent of the frame further than is necessary in cutting other wheels: the opening B of the plate A B seems to have no other use, except for the eye to look through at the cutter, when the workman stands behind the cheeks to turn the first moving wheel of the cord, which wheel, we remarked, is not very conveniently placed to consult the easy position of the body, during the act of cutting. This frame being attached to the sliding part H I, of *Plate IV.*, is of course capable of the adjustment for distance from the arbor of the plate, on which the wheel is placed, that requires to be cut.

Fig. 2, of Plate V. is a representation of the apparatus for cutting the interior edge of an annular wheel, such as is used in a theodolite, and solar microscope, &c. of $\frac{1}{2}$ of the actual size. A B is the ring or annular wheel to be cut, which is fixed to the top of the arbor by means of the wooden chuck, on which it was turned in the lathe, and *a b c d* is a short frame for the cutter *e*, and cutter-arbor, seen detached in two pieces in *fig. 3* of $\frac{1}{2}$ the real size. This small frame is attached to the face of the cutter frame in *Plate IV.*; its arbor, *ab*, enters the hole of the arbor at S, and an opposite hole not seen in *Plate IV.*, after the arbor, R, has been previously removed, and is made fast by the two screws *x* and *x*, entering the holes *e* and *d*, of *fig. 2. Plate V.*; the interior teeth are then formed by the small cutter, by a process similar to that of cutting the exterior teeth of a wheel in the ordinary way.

Fig. 4, of Plate V. is a contrivance of $\frac{1}{4}$ of the real size, for cutting a rack into any number of teeth per inch, by the aid of the engine plate and common cutters, thus; A and B are two strong cocks screwed fast to the opposite sides of H I, already described in *Plate IV.*; C is a piece of metal forming a bed for the oblong bar, D E, to rest on; this bar, which is a rack already cut, is placed with its teeth in action with a wheel of 74 teeth nicely rounded, that is attached to the arbor of the plate in the usual way; under the bar D E, and fast to it, is a rib parallel to its sides, moving easy in a corresponding long groove made in the bed, C, to receive it, the motion of which is made smooth by friction wheels interposed and borne by the bed;

the bar, D E, has a great number of holes drilled and tapped in it, that the moveable corks or clamping pieces, F, F, and F, may fix any bar, G, to be cut into the requisite rack; when the mechanism is thus arranged and properly fixed, the motion of the wheel, caused by moving the subjacent plate, a given number of holes of any circle fixed on, will carry the racked bar D E, and bar G along with it, over the bed a certain distance, between the cutting of each space of bar G, and this distance may be made $\frac{1}{10}$ th, $\frac{1}{12}$ th, or $\frac{1}{20}$ th of an inch, according to the number of divided holes on the plate, passed over by the moving index, between each operation of cutting.

These three appendages render the engine competent to cut teeth in all ways, and on all wheels and bars that are in use in mechanical contrivances; but the teeth thus formed with ordinary cutters, are in the shape of parallelograms, and require to be rounded by hand with a file or files of different coarseness and shape; the contriver, in common with other workmen, had experienced the inconvenience attending the finishing, both as it was a laborious operation, and liable to produce irregularities in the shape of the tooth, on which the equable transmission of power and velocity entirely depend, in clocks, watches, and other delicate machines; he therefore constructed his cutters in such a way, that they rounded the teeth at the same time that they cut the spaces; this invention is very important to the successful application of racks and wheel-work in many cases, where a good shape of the tooth is indispensable, and has been claimed by both Rehe and the late ingenious Merlin; but which of the two, if either, was the real inventor, remains to be decided.

Plate VI. of Engines, contains the drawings of some cutters to answer the purpose of rounding the teeth during the act of cutting, and also the apparatus for forming the cutting edges and for sharpening them when blunt, which apparatus is indispensably necessary to accompany the engine when *finishing cutters*, as we shall henceforth call them, are adopted in practice.

A A, in *fig. 1*, is the front side of a wooden bench, to which a foot wheel, as a first mover, is fixed out of the drawing, and B B is a small frame attached to its inferior plane; C C C is a species of small lathe, with a three-grooved pulley revolving on a solid arbor, together with the arbor itself; this lathe is attached to the brass plate D D, and by means of it screwed fast to the wooden bench A A; at the exterior end of the arbor that bears the pulley, is fixed a circular copper plate, E, with its plane at right angles to the said arbor, which plate consequently revolves with the pulley, when the foot wheel gives motion to the cord that embraces it: just above the brass plate, D D, of the small lathe, lies parallel thereto another stronger but smaller plate, F F, attached to and borne by a side plate, G G G G, that fits the frame under the bench, and slides up or down to nearly the height required in use, in which it is fixed by the thumb screw at H, under the bench; at the ends of the plate F F, which we will call the bed of the cutter frame, or frame for holding the cutter while grinding, are two cross bearing pieces near F and F respectively, on each of which are cut three semi-circular notches, some of which are seen at *a, a,* and *a*; I I is the horizontal plate of a cutter frame resting on the horizontal tapped wire, K, that has got a milled nut screwing upon the tapped part beyond the bed F F, and has its opposite bearing end concealed under the other parts; this plate, I I, may be fixed to any part of the bearing wire, K, by the thumb screw *b*, and will have a little circular motion round the wire, to the right or left, when not held in the

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band, or nicely balanced; above this plate, II, lies a still smaller plate, L, that bears the cock M, and another similar one concealed, but opposite to it; which small plate, L, is moveable round a centre of motion under it, on the next subjacent plate II, but can be fixed in any given position by the thumb-screw at L, agreeably to the graduations marked near its extreme end, beyond the circular groove penetrated by the thumb-screw, for which graduations a line on the small cock, *d*, constitutes an index; into the cock M, and the one concealed, passes an arbor not seen, that may be called *e*, which is capable of being fixed by pressing screws at the exterior sides of the said cocks; across this arbor, *e*, at right angles, is a long hole, or tube, into which the cutter arbor is inserted, and fixed by a pressing screw N; so that the plane of the cutter may be made either horizontally parallel to the copper circle E, or to stand in an inclined direction; accordingly as the arbor, *e*, is turned more or less round before it is fixed by its pressing screws at M, and at the opposite pivot; while the thumb-screw at L, by the help of the graduations near it, fixes the planes of the cutter and circular plate, E, vertically parallel, or at any given angle of reclination to each other, as the shape of the acting faces of the tooth may require; the nut at D limits the proximity of the cutter to the circle E. In the present position of the cutter, its plane is smoothed by emery smeared over the copper circle, as the arbor revolves, and while the plate, II, has a circular motion given it backwards and forwards by hand, round the bearing wire K, which alternate motion carries the cutter across the plane of the grinding circle E, and assists the grinding; upon the arbor *e*, not seen, is a second divided scale of a circular shape, like a micrometer head, by means of which the situation of this arbor, and consequently of the cutter's plane, is adjusted before the pressing screws are made quite fast; and a small gauge, near *f*, like a small leg and foot, moveable at its knee, on the cock, presents its heel to a tooth of the cutter, and limits its position in such a way, that each succeeding tooth to be sharpened may be fixed, by the pressing screws, in precisely the same situation while they are respectively sharpened. By the help of these various adjustments of the plane of a cutter, such, for instance, as is seen in two views in *fig. 2*, the preceding or cutting part of each tooth is made thicker than the following part, and also the part at the periphery thicker than the part nearer to the centre, which shape makes the cutter clear itself in the space it cuts as it advances, a condition that experience has proved to be necessary in forming or sharpening a cutter. When one plane of each tooth of a cutter has been gone round, the planes are reversed, and the cutter fixed as before by the help of the scales, gauge, and screws, and then the former process of grinding the teeth singly in succession is repeated.

When the plate II, with its appendage, which together we have called the cutter frame, is lifted out of the semicircular notches or bearings on the ends of the bed FF, and is laid aside; another nearly similar frame, seen in *fig. 3*, is put into its place, with the parallel wires, *a, a*, and *a*, resting in the said semicircular notches, as in *fig. 1*, are denoted by the same characters; in this situation the nut, D, in *fig. 3*, falls in the place of nut D in *fig. 1*, and answers the same purpose of adjustment for proximity of the cutter to the grinding circle E; the small upper plate, L, is also nearly the same as in *fig. 1*, both as to its positions and uses, where also the index line of the small cock, *d*, points out the degree of obliquity on the graduated sectoral part; but here the frame is not a single plate II, resting on the

bed as in *fig. 1*, but has a motion round the pivots *b* and *b*, placed on another plate that bears the wires *a, a*, and *a*, so that the two plates may be made to open, and form a blunt wedge, by turning the screw *k*, which bears on the lower plate with its point, and is tapped into the upper plate, after which adjustment for height, which cannot be made nicely by sliding GGG only, the position is rendered permanent by the fixing nut, *l*, that takes a tapped stud fixed to the lower plate. In this figure, the arbor that holds the cutter is in the situation of the arbor *a*, *fig. 1*, which we said cannot be seen; and the ends of the teeth are presented to the grinding face of E, which position of the cutter could not be attained by the mechanism of *fig. 1*. On the cocks that bear the pivots of the cutter arbor, are fixed two small cannons, on which the bent arms, *m* and *m*, revolve, and are fixed by the pressing screws *n* and *n*; the play of the arbor is limited by the two thumb-screws *o* and *o*, fixing the stops in their respective places; and a wire, *k*, connected with the arms *m* and *m*, forms the centre of motion of the leg or gauge, which is here better seen than in *fig. 1*, and performs a similar office. It is hardly necessary to add, that after each tooth is pointed in this way, the fixing screws *m* and *m*, and also the gauge *f*, are released for the moment, and brought back again to their original situation at the adjustment of every successive tooth to the grinder.

For sharpening the front edge of a tooth, the cutter must be reversed, the bed lowered, and the nut, D, turned back, till the position, represented in *fig. 4*, be obtained; in which the teeth are successively ground as before directed.

The mechanism above described is all that would be necessary, if the tooth of the cutter were made by straight lines to cut teeth of a shape like a parallelogram, but to round them at the same time required another addition, which remains to be described.

In *fig. 5*, are seen two different views of a cutter, such as will round the teeth and cut them at the same operation, by means of the sides of the cutter's teeth being formed into curves; these curves ought to be epicycloids, or involutes of a circle to constitute a tooth of any wheel of the exact shape requisite for the equable transmission of power and velocity, and these curves should vary in shape with the size of the wheel compared with its pinion or fellow-wheel; but such niceties cannot be obtained in practice without almost infinite trouble; therefore the same cutter, once shaped and sharpened, is used for wheels of different diameters, where its thickness is found proper. *Fig. 6*, shows how the side curves of the cutter's teeth are formed, where a cylinder of copper is substituted in the small lathe CCC, *fig. 1*, for the arbor and circular plate E; *fig. 3*, is then applied to the bed FF, and the side of the tooth is adjusted to touch the side of the cylinder as it revolves; this mode of application would make the curve circular if the cutter-arbor were to stand at right angles with the grinding cylinder; but as any degree of obliquity can be given, by undoing the thumb-screw *b*, and moving L, the position ought to be such as to make the tooth rest obliquely against the cylinder, more or less, as the shape may require, in which case an elliptic curve, instead of a circular one, is formed on the edge of the cutter, by reason of the oblique section of a cylinder forming an ellipse, which curve approximates nearly to the shape required in a given degree of obliquity, and may always be used when once determined. When the curves on one side of each tooth of the cutter are thus formed, which are assisted by a motion lengthwise of the frame in the bed, while the wires *a, a*, and *a*, slide in their bearing notches, the planes of the cutter

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cutters are reversed and the opposite corresponding curves are formed in a similar manner. Cutters of this kind not only facilitate the labour of making wheels, but render them more perfect than manual filing can possibly do; and it is to be regretted that clockmakers in general will not go to the additional expence of having them thus formed. Thus, each of the two engines we have described, have appropriate advantages; and we think it would not be difficult to construct one that would unite the advantages of both, and be preferable to either.

CUTTING-off, in *Military Language*. See **RETRENCHMENT**.

CUTTING, in *Inland Navigation*, signifies the same with digging or excavating; and thus they say, such a part of the canal is in level-cutting, or in deep-cutting, according as the surface of the water is nearly level with, or considerably sunk below, the natural surface of the ground. Several of the most remarkable instances of deep-cutting upon the British canals, are mentioned in our article **CANAL**. See *Plate 1. Canals, fig. 6*.

CUTTING, in *Painting*, the laying of one strong lively colour over another, without any shade or softening. The cutting of colours has always a disagreeable effect.

CUTTING in wood, a particular kind of sculpture, or engraving; denominated from the matter wherein it is employed.

It is used for various purposes; as, for figured letters, head and tail-pieces of books; and even for schemes, and other figures, to save the expences of engraving on copper: and for prints, and stamps for paper, calicoes, lincens, &c.

The invention of cutting in wood, as well as that in copper, is ascribed to a goldsmith in Florence; but it is to Albert Durer, and Lucas, they are both indebted for their perfection. See **ENGRAVING and PRINTING**.

One Hugo de Carpi invented a manner of cutting in wood, by means whereof, the prints appeared as if painted in *claire-obscur*. In order to this, he made three kinds of stamps for the same design; which were drawn, after one another, through the press for the same print: they were so conducted, as that one served for the grand lights, a second for the demi-tints, and a third for the outlines and the deep shadows.

The art of cutting in wood was certainly carried to a very great pitch above two hundred years ago; and might even vie, for beauty and justness, with that of engraving in copper. It was reduced however to a low condition, as having been long neglected, and the application of artists was wholly employed on copper, as the more easy and promising province: not but that wooden cuts have the advantage of those in copper on many accounts; chiefly for figures and devices in books; as being printed at the same time, and in the same press, as the letters: whereas, for the other, there is required a particular impression. In the representation of plants and flowers, and in designs for paper-hangings, where the outline only is wanted to be printed, in a bold full manner, this method will be found cheaper and more effectual than the use of copper-plates. It has been lately revived by the Bewicks of Newcastle; and several other persons have applied the art with great success; so that some of their vignettes have a brilliancy and force, which almost rival the first and finest productions on copper.

The cutters in wood begin with preparing a plank or block, of the size and thickness required, and very even and smooth on the side to be cut: for this, they usually take

beech, pear-tree, or box; though the latter is the best, as being the closest, and least liable to be worn-eaten. The wood being cut into a proper form and size, should be planed as even and truly as possible; it is then fit to receive the drawing or chalking of the design to be engraved. But the effect may be made more apparent, and the ink, if any be used in drawing, be prevented from running, by spreading thinly on the surface of the wood, white lead, tempered with water, by grinding with a brush: pencil, and afterwards rubbing it well with a fine linen rag, whilst it is wet; and when it is dry, brushing off any loose or powdery part with a soft pencil.

On this block they draw their design with a pen, or pencil, just as they would have it printed. Those who cannot draw their own design, as there are many who cannot, make use of a design furnished them by another; fastening it upon the block with paste made of flour and water, with a little vinegar, or gum tragacanth; the strokes or lines turned towards the wood.

When the paper is dry, they wash it gently over with a sponge dipped in water: which done, they take off the paper by little and little, still rubbing it a little first, with the tip of the finger; till at length there be nothing left on the block, but the strokes of ink that form the design, which mark out so much of the block as is to be spared, or left standing. Figures are sometimes cut out of prints, by taking away all the white part or blank paper, and cemented with gum-water to the surface of the wood.

The rest they cut off, and take away very curiously with the points of very sharp knives, or little chisels, or gravers, according to the bigness or delicacy of the work; for they need no other instruments.

It differs from engraving in copper, because in the former, the impression comes from the prominent parts, or strokes left uncut; whereas in the latter, it comes from the channels cut in the metal.

The manner of printing with wooden prints is much more expeditious and easy than that of copper-plate: because they require only to be dipped in the printing-ink, and impressed on the object in the same manner, and with the same apparatus as the letter printing is managed; and for purposes that do not require great correctness, the impression is made by the hand only, a proper handle being fixed to the middle of the print, by which it is first dipped in the ink, spread by means of a brush, on a block of proportionable size covered with leather; and then lifted up instantly, and dropped with some little force on the paper, which is to receive the impression. *Handmaid to the Arts, vol. ii. p. 222.*

CUTTING, in *Gardening*, a small portion of a branch, twig, shoot, or other part of a plant, cut off for the purpose of planting, with a view of increasing the kind of tree, shrub, or plant from which it is taken.

There are numerous trees, shrubs, and plants which are capable of being propagated with facility in this way; but in some, the young tender shoots or branches of one or two years growth can only be employed with success; while in others, the large boughs, or even poles, may be made use of with the greatest certainty of their growing. This is the case with most of the aquatic kind of plants; as the willows, poplars, &c. And there are still others in which the leaves can be had recourse to, as the agave and aloe kinds.

For the most part in the herbaceous and succulent plants, cuttings of one or two years growth are commonly used; but

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but in those of the tree sort, those of one year; and in those of the hard wooded kind, those of the same year's growth.

The most proper lengths for making the cuttings are different in different sorts, according to the nature and habits of growth of the plants; but in common, from three or four inches to a foot, or a foot and a half; the strongest requiring in general the most length to be left to them.

In the business of the choice of shoots, branches, or other parts for this use, those of the firmest and most even growth, and the freest from lateral shoots, should be fixed upon. In most strong-shooting trees and shrubs, and all the more succulent plants, the cuttings should be taken from the lateral or terminal shoots. The cuttings in the herbaceous are usually made from the stems that support the flowers, which should be cut off from the bottoms, and afterwards divided into suitable lengths for the purpose.

In some particular sorts, as those of the tree and shrub kinds, it is found advantageous in some cases to take them off with an inch or more of the former year's wood, as in the vine, laurel, and some others of a similar nature.

In the mode of preparation of cuttings for planting, the only thing necessary is that of trimming of such side-shoots as may be present, and occasionally the crooked straggling tops in the deciduous kinds; but this should not be done in the evergreen or herbaceous succulent sorts. Where the shoots are of considerable length, the lower parts should principally be employed for the purpose of cuttings.

The proper seasons for planting out cuttings are, according to their kinds, either the spring, summer, or autumn. The first and the last are in general the best for most sorts of trees and shrubs. Those of the herbaceous and flowering kind mostly succeed best when planted in the spring and summer months; but those of the luxuriant and more succulent sort answer best when put into the earth in the summer season.

In the business of planting the cuttings of different sorts of plants, such as those of the tree, shrub, and other kinds that are not succulent, they should be put nearly two-thirds of their lengths into the ground; but those of the succulent sort should only be put lightly into the soil, so as just to support them in their proper position, as when put in too deep they are apt to rot, and do not take root so readily. The cuttings of most of the tree, shrub, and plant kinds should be put into the soil as soon as possible after they are made; but those of the succulent tribe are better to remain out of the earth till the cut parts be fully incrustated or healed over, as when put in while the moisture is oozing out, they are apt to rot and be destroyed. In all the sorts the mould should be well pressed about them, and in the former kinds be kept properly cool by watering. It is also of great use to keep them perfectly steady in the earth when they are first put into it.

In the management of cuttings after being planted out, different methods must be pursued according to circumstances; some succeed perfectly in the open ground, others in sheltered shady situations; some require to be placed in pots, for the convenience of occasional protection in severe weather, and others to be plunged in hot-beds in order to promote their striking root, as is fully explained under the culture of each particular sort of plant.

The length of time which is necessary for striking root is also different in the different sorts. In many of the tree, and some of the herbaceous, shrubby, and succulent kinds, it will be perfectly effected in the course of one or

two months; and in almost all the sorts in the course of a twelvemonth. When assisted by artificial heat, it is always effected in a more expeditious manner than where the contrary is the case.

In this method of propagation, the varieties of all the different curious species which are capable of being increased in this way, may be equally preserved and kept distinct, as in the practices of budding, grafting, and layering.

In order to raise plants of many sorts in this manner, much attention is not only necessary in regard to season, but great care required in their management.

CUTTING-Box, in *Rural Economy*, is a contrivance of the box kind constructed for the purpose of cutting different sorts of materials, as straw, hay, and the haulm or stems of various plants, as those of the pea, bean, and other similar kinds by the hand, into a small state, or what is usually denominated chaff, to be employed as cattle fodder.

It is a sort of tool which has undergone various alterations and improvements since it was first invented; but it is only necessary to notice those which have more lately been made, for the present purpose. The first of which consists in the addition of what is termed a *presser*, to the original long, narrow box, which is open on the upper part. This is formed of a piece of wood of the same length with the width of the box, having a number of upright tongues or tines somewhat similar to those of the prongs of the hay-fork. These tongues are passed through the materials to be cut, and by means of a rope or thong of leather, fastened thereto, and extending below the box, the presser is forced down by the left foot of the person employed in cutting, and the bundle, of course, kept light. By this means the materials are cut into chaff with great ease and facility, the operator raising his left foot after every cut, pushes his sheaf or bundle forward, with his left hand, then presses it down again with his foot, and makes another cut, continuing to work in this manner, till the whole of the bundle is finished.

Since this, more simple contrivances have been introduced for effecting these different purposes; and lately a *lever-handle* has been added, with some other alterations, by which it is supposed that the materials are cut with greater convenience and facility.

In the midland counties, according to Mr. Marshall, a "chaff box" is made use of, which is somewhat peculiar in its construction, uniting in some measure "the old single-handed machine and the more modern one with a wheel of blades." It has a long upright knife, but feeds itself, in consequence of which the cutter is left with both hands at liberty for the knife. It is suggested as being however somewhat complex, and more suited for a person who makes "straw-cutting" his employment, than for the servant of the farmer. See *CHAFF-Cutter*.

CUTTING-Knife, a tool used by the patten-makers and borne in their armorial ensign.

CUTTING-Over, in *Gardening*, the operation of thinning and shortening the branches of different sorts of fruit trees, as the currant, gooseberry, &c. It is necessary to the proper bearing of such shrubby fruit trees, that this sort of cutting *in* or *over* should be annually performed.

CUTTING-Teeth, in *Anatomy*. See **CRANIUM**.

CUTTLE-fish, *Sepia*, in *Zoology*, a genus of the *Vermes Mollusca*. (See **SEPIA**.) The *Sepia officinalis*, or common cuttle-fish, when it is in danger of being taken, is said to emit a black liquor like ink, contained in a bag near the cœcum, in considerable quantities, whereby the water being obscured, it finds an opportunity of escaping; and from this.

this property it has got the name of the *ink-fish*. It is not wholly a stranger to our seas, as appears from its bone being found on our shores. It is occasionally caught on the southern coasts of England, but more frequently on those of Italy.

CUTTLE-fish bone, *Sepia os*, or *testa*, is a white, spongy, testaceous substance, growing on the back of the cuttle-fish, and seeming almost to be calcined by the sun.

From some experiments lately made by the ingenious Mr. Hatchett upon the cuttle-bone of the shops, he infers, that the term bone is here misapplied, if the presence of phosphate of lime is to be regarded as the characteristic of bone (see *BONE*): for this substance, in composition, is exactly similar to *shell* (which see), and consists of various membranes, hardened by carbonate of lime, without the smallest mixture of phosphate. This substance is rough and absterfve, and chiefly used in medicine as a dentrifice. It is hard on one side, but soft on the other, so as to receive neat impressions from medals, and to serve as a mould for the casting of metals, which thus take the figure of the original. It is likewise used for polishing or cleansing silver. (Lewis's Com. P. T. p. 333, & seq.)

M. Chaptal says (*Elem. Chem.* vol. iii.) that the eggs, the scales, and the black fluid of the cuttle-fish, are still used in medicine. The eggs deterge the kidneys, and excite urine and the courses. The scales and bones are applied to nearly the same uses; they are likewise used as an astrigent, and enter into the composition of dentrifice powders, collyria, &c.; the goldsmiths likewise use them to make their moulds for casting spoons, forks, toys, &c., because their spongy part easily receives the impression of metals. The black humour of the cuttle-fish may be used instead of ink. We read in the fables of Perius that the Romans used it as an ink; and Cicero calls it "atramentum." It seems that the Chinese use it as the basis of their famous ink. "Sepia pifeis est qui habet succum nigerrimum instar atramenti, quem Chineses cum brodio orizæ, vel alterius leguminis, inspissant et formant, et in univfersum orbem transmittant, sub nomine atramenti Chinesis," (Pauli Hermani *Cynofura*, t. i. p. 17, par. 2.). Pliny was of opinion that the black humour of the cuttle-fish was its blood. Rondelet has proved that it is the bile. This liquor is dried in the bladders, then separated from the membrane, and ground with gum-water. It is used by the Italian artists for tinted drawings, and is in many respects preferable to China-ink. Sonnini informs us, (*Travels in Greece*, &c. p. 416.) that the Greek women use the back-bone as a pin-cushion; and that, in the isle of Seio, they calcine it, and reduce it to a fine powder, with which they blacken their eyebrows. The solid and almost ossaceous part is the bait with which the Greek fishermen usually garnish their lines, in order to take the eight-armed cuttle-fish (*Sepia octopus*).

CUTTOFOE, in *Botany*, a name given by the people of Guinea to a plant which they esteem greatly for its medicinal virtues. They boil it in water, and give the decoction in all cases of the colic, in which it proves a cure. It is the *Hedyfarum hamatum* of Linnæus, but was formerly supposed to be a species of *ononis* or *anonis*; and is well figured and described by sir Hans Sloane, under the name of *anonis non spinosa minor glabra procumbens flore luteo*, the yellow-flowered, small, procumbent, smooth *anonis*, without thorns.

It is found in vast abundance on the banks of the Rio Cobre, near the city of St. Jago de la Vega, or Spanish Town. *Phil. Trans.* N^o 232.

CUTTS, flat-bottomed boats, built low and commodi-

ously, used in the channel for transporting horses. *Stow, Annal.* p. 412.

CUTT'S-Island, in *Geography*, a small island of America, on the coast of York county, in the state of Maine.

CUTTUPIEA, an island in the N.E. part of the bay of Bengal, N. lat. 21° 53'. E. long. 92°.

CUVAGNA, a town of Italy, in the territory of Friuli, belonging to the state of Venice; five miles N. of Udina.

CUVES, a small town of France, in the department of La Manche, 12 miles N.E. of Horanches.

CUVETTE. See *CUNETTE*.

CUVIERA, in *Botany*, *Rosl.* See *ELYMUS Europeus*.

CUVILLER, FRANÇOIS, in *Biography*, an architect, who was born in 1698 at Soissons in France. He was educated at Paris, and afterwards went to Munich, whither he was invited by the then elector, who succeeded to the imperial crown by the name of Charles VII. Cuviller was employed by the elector in many public buildings. He continued in the service of the court until his death, which happened in the year 1760; leaving behind him many plans and designs, which were afterwards engraved by different artists, and published by his son, François Cuviller, who was born at Munich in 1734, and succeeded his father as architect to the court. Heineken.

CUVILLY, in *Geography*, a small town of France, in the department of the Somme, nine miles S.E. of Mont Didier.

CUXHAVEN, a small town of Germany, in the district of Ritzebuttel, to which it is so contiguous that it appears the same place, is situated on the mouth of the river Elbe, and belonged formerly to the city of Hamburg, but is at present in the possession of the French. It has a small but convenient harbour, and affords a safe retreat, or a good anchorage in the roads, to vessels outward-bound detained by contrary winds. After the conquest of Holland by the French, regular English packets used to sail betwixt Harwich or Yarmouth and Cuxhaven, until the latter place fell likewise into their hands at the renewal of the war in 1803.

CUYABA, a mining station in the interior of Brazil, seated on a river of the same name, which joins the river Paraguay beneath the marsh of Xaraes.

CUYCK, a town of Brabant, in a small territory of the same name, of which Grave is the capital; four miles E.S.E. of Grave, and twelve W. of Cleves.

CUYLENBURG, in *Biography*, a painter of the 17th century, who is said by some to have been a disciple of Cornelius Poelemburg, whom he appears to have imitated as well in the choice of his subjects as in the manner of executing them. He is, however, inferior to his model. A brown tint too generally pervades his pictures, which are upon a larger scale than those of Poelemburg, and are deficient in that correctness of design, and delicacy of finish, which characterize the genuine productions of that esteemed artist. Pilkington.

CUYO, in *Geography*, a province of South America, in the viceroyalty of La Plata, or Buenos Ayres, situated amidst the mountains which extend from the great chain towards Cordova, but having many fertile vallies; as it is separated from Chili on the west by the Andes, the administration is annexed to that of Cordova. Its chief town is St. Juan de la Frontera. This province produces in great abundance grapes, figs, pears, apples, and most kinds of European fruits, which form the chief articles of its trade. Wines, brandy, and dried fruits, are also carried to Buenos Ayres, Cordova, and other parts of the four intendancies.

The

The mountains of Cuyo and Rioja abound in metals; but the passes are difficult, so that there is no inducement to work them. In the northern part of the same chain are many flocks of vicunas, whose wool is sometimes wrought in the country, but chiefly sent to Europe, where it is celebrated as the first of all in broad cloths, uniting the gloss of silk, with the firmness and warmth of woollen, while the native fawn-colour can scarcely be exceeded in beauty.

CUYP, in *Biography*. See КУУР.

CUZCATLAN, in *Geography*, a river of New Spain. See ST. SEBASTIAN River.

CUZCO. See CUSCO.

CUZEAU, a small town of France, in the department of Saône and Loire; 15 miles S.E. of Louhans, and 36 of Châlons.

CUZUMEL, an island of America, in the province of Yucatan, and audience of Mexico, situated in the bay of Honduras; 15 leagues long and five broad: its principal town is Santa CRUZ, which see. N. lat. 19°. W. long. 87°.

CYALOS, in *Ancient Geography*, a town of Asia Minor, in Lydia. Steph. Byz.

CYAMEA, in *Natural History*, the name by which the ancients call the black flinty eagle-stone. Pliny describes its blackish colour, and says, that when broken, there was found within it another stone of the bigness of a horse-bean. This is what rattles in it when shaken.

CYAMON, in *Ancient Geography*, a promontory of Crete, according to Ptolemy, thought to be the present *Capo Spada*.

CYAMOSORUS, a river of Sicily, in the environs of the town of Centuripa, according to Polybius; supposed to be the present *Traina*.

CYAMUS, in *Botany*, (*κυμαος*, originally the Greek name of a plant, which appears to be not specifically different from our common cultivated bean, afterwards extended by Theophrastus and other writers to the plant now before us, on account of a fancied resemblance in the seeds.) Smith Exot. Bot. p. 59. Salisbury in *Annals of Botany*, vol. ii. p. 75. (Nelumbo; Gært. 85. Nelumbium; Juss. 68. Vent. ii. 216. and iv. 32. Poir. in *Encyc. Willd.* 1075.) Class and order, *polyandria polyandria*; Nat. Ord. *Succulentæ*; Linn. *Hydrocharidæ*; Juss. *Nymphææ*; Salisb.

Gen. Ch. *Recept.* inversely conical or top-shaped, truncated, honey-combed or hollowed into numerous cells, which are open at the top. *Cal.* Perianth four or five-leaved, inserted into the receptacle, permanent. *Cor.* Petals generally numerous, inserted into the receptacle. *Stam.* Filaments very numerous, inserted into the receptacle, much shorter than the corolla, curved. *Pistl.* Germs solitary in each cell of the receptacle; styles single, very short; stigmas simple. *Seeds* solitary, attached by a short umbilical cord to the bottom of each cell, and appearing above the top, globular or oblong, resembling nuts, fleshy within, terminated by the permanent style.

Eff. Ch. *Calyx* of four or five leaves. *Seeds* half immersed in a cellular receptacle, each crowned by its own style.

Sp. 1. *C. Nelumbo*. Smith Exot. Bot. tab. 31. 22. (*C. mytilicus*; Salisb. Ann. Bot. i. *Nelumbo nucifera*; Gært. tab. 19. fig. 2. *N. javonica*; Poir. Enc. *Nelumbium speciosum*; Willd. 1. Bot. Mag. pl. 903. A.B. *Nymphæa nelumbo*; Linn. Sp. Pl. 1, *æ.* Mart. Mill. Dict. 6. Hort. Kew. 227. *N. fabifera*; Pluk. alm. 267. tab. 322. fig. 1. *N. indica faba ægyptiaca dicta*; Herm. par. 205. tab. 205. Taratti, five *N. indica major*; Rumph. amb. 6. 168. tab. 73). "Leaves peltate, orbicular, undulated; petioles and peduncles prickly." Dr. Smith. "Anthers rising above the cells, club-shaped." Mr. Salisbury.

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"Leaves peltate, orbicular, quite entire; peduncles and petioles mucronate; corolla polypetalous." Willd. "Leaves lobed, undulated, plaited, nerves underneath umbellate." Poir. β . *Nelumbo indica*; Poir. Lam. Ill. Pl. 453. *Tamara*; Rheed. Mal. 11. 59. tab. 30, and Bern. *Tamara*, 11. 61. tab. 31. "Leaves flat, quite entire, with two opposite indentures, each of which has a mucronate projection in the middle." Poir. *Root* perennial, large, tuberous, black without, white within, throwing out numerous long fibres. *Stem* none. *Leaves* radical, smooth, rather glaucous, with many concentric radiating ribs; when young, floating on the water; when full grown, rising three or four feet above it, and becoming two or three feet in diameter, concave, variously waved, twisted or torn by the wind; petioles long, cylindrical, prickly, upright. *Flowers* on simple naked peduncles, resembling the petioles, but rather taller; solitary, upright, very handsome and fragrant, eight or ten inches wide when fully expanded, lasting for several days; calyx-leaves four or five, green, egg-shaped, concave; petals numerous, in several ranks, differing in size, sometimes white, but most commonly of a delicate pale rose-colour, white, marked with many crimson longitudinal ribs, which drawing nearer together as they approach the point, render that part of a deeper hue; stamens numerous, yellow, filiform, knobbed; anthers oblong, lateral, germ protruding through the orifice of the cell; stigma oblong, obtuse, perforated, yellow. *Receptacle* finally coriaceous, separating from the stalk, and floating down the water, laden with ripe oval nuts or seeds, which vegetating, render it a cornucopia of young sprouting plants, till at length breaking loose from their confinement, they take root in the mud. The petioles are divided internally into several longitudinal tubes, containing a thick, whitish, gummy fluid, which condenses when exposed to the air, and draws out into long threads, like those which are spun by a spider. The variety β is considered by Poiret as a distinct species; but appears to differ chiefly, if not entirely, in the shape of the leaves. A native of the East Indies, Cochinchina, China, Java, &c.; in many parts of which it is esteemed a sacred plant, and makes a conspicuous figure in their mythology as the symbol of fertility. It was known to the Greeks; and is said by Herodotus, Theophrastus, and others, to be a native of Egypt: but no modern traveller has observed it in that country. There can, however, be no doubt of its having actually existed there, since the terms in which it is described by those authors, are too clear and decisive to be mistaken; and their accounts are confirmed by ancient Egyptian sculptures and mosaics which are still preserved, and testify that from the earliest times, it, as well as the proper lotus, has obtained a religious reverence. It is remarkable that neither Herodotus nor Theophrastus, the most ancient Greek writers, by which it is described, have attributed to it a sacred character; but only speak of it as used by the Egyptians for food. The former distinguishes it by no particular name, but gives both to it and the lotus the common denomination of lily, a term which appears to have been applied by the Greeks to various plants with large specious flowers. Having observed that a paste is made of the pith of the lotus, and baked into bread, he adds, there are also in the river other lilies, resembling a rose and bearing a fruit very like a wasp's nest, which contains numerous esculent seeds about the size of the stone of an olive, that are eaten both raw and roasted. A total want of botanical knowledge has caused both our English translators, Littlebury and Beloe, to mistake the meaning of the original with respect to the situation of the fruit. Littlebury places it at the foot of the stem: Beloe,

by a still greater biunder, says, it grows from the bottom of the root, where we believe no proper fruit ever grew. The words of Herodotus are, ἡ καρπὸς ἐ ἀλλήν' καὶ οὐκ ἀπὸ τοῦ ἑστέως ἑστῆς ῥίζης ἔσται; meaning, no doubt, that the *stalk* of the flower, as well as of the leaves, springs directly from the root, without the intervention of a *stem*; though it is expressed too concisely to be easily understood, by those who are not acquainted with the plant. Theophrastus describes the plant more fully in the beginning of the tenth chapter of his fourth book, and calls it simply *κυμαίος* without any discriminating epithet; but he could not have confounded it with the well known *κυμαίος* or bean of his own country, which he mentions in various parts of his work, and particularly describes in his eighth book; and which appears by unequivocal characters to be of the leguminous kind, and not essentially different from our common cultivated bean. To prevent confusion the exotic plant was generally called by subsequent authors *κυμαίος αἰγυπτίος*, the Egyptian bean, and is expressly said by Strabo to be so called, because in its fruit it resembles the Grecian bean, differing only in size and taste; καὶ καρπὸς ὁμοίος τῷ παρ' ἡμῶν κρεῖσσιν, μεγέθει μόνον καὶ γούσῃ διαλαττόντα. According to Dioscorides it was sometimes called the Pontic bean, and is said to be a native not only of Egypt, but also of Asia Proper and Cilicia. Theophrastus had said before him that it grew, though it did not attain to its proper perfection, in Syria and Cilicia; and had even added, that it completely ripened its fruit in a lake near Torone in Chalcis. But in all these situations some species of *nymphaea* must certainly have been taken for it.

Dr. Smith has started an ingenious, and we believe, perfectly original, conjecture, that the plant before us is the real mystical bean of Pythagoras, concerning the prohibition of which to his followers so much has been written and so little determined. He supposes that this celebrated philosopher imbibed the notion of its sacred character during his travels in India, if he actually went thither, or else in Egypt at second hand from India, and that afterwards, when he propagated his acquired philosophy in Samos, Greece, and Italy, he took as a substitute for it, since it did not grow in his own country, a common seed resembling it, which the common horse bean does very nearly. He consequently understands the famous prohibition in a literal, not in a figurative sense. The total disappearance of the plant from modern Egypt favours the idea that it was not indigenous there, but brought from India. And we should find but little difficulty in acceding to the opinion of our learned friend, if we had not very strong doubts concerning the truth of the modern doctrine which derives the mythology of Egypt from that of India: but after all we have read on the subject, we do not scruple to confess that this doctrine appears to us to be in all its parts unfounded.

However that may be, we entirely agree with him in preferring the classical *cyamus* to the barbarous *nelumbo* or *nelumbium*; as the former name has not hitherto been appropriated in modern botany, and as it is certainly applied to our plant, by the Greek writers, though not in an exclusive, or as a primary sense. The root and the seeds are now used in the East Indies as articles of food, in the same manner as they formerly were in ancient Egypt. The root, having been called *colocasía* by some Greek writers, has sometimes been mistaken for the modern *colocasía* of the shops, which is the root of *arum colocasia*. 2. *C. luteum*. Salisb. Ann. bot. 2. (*Nelumbium luteum*; Willd. 2. *Nymphaea Nelumbo*. β. Linn. Sp. Pl. N. glandulifera virginiana; Moris. hist. 3. 514. Pluk. Alm. 567.) "Anthers rising above the cells, linear." Salisb. "Leaves peltate,

orbicular, quite entire; peduncles and petioles smooth; corolla polypetalous." Willd. *Flowers* pale yellow. Mr. Salisbury asserts that the petioles are prickly and not smooth, as Willdenow describes them. A native of the rivers in Virginia, Carolina, and Florida. 3. *C. pentapetalum*. (*Nelumbium*; Willd. 3. *Nymphaea*; Walt. Car. 155.) "Leaves peltate orbicular, quite entire; calyx five-leaved; corolla with five petals." A native of Carolina. Mr. Salisbury thinks that the genus of the last two species is not sufficiently ascertained.

Propagation and Culture.—The first species has flowered lately in several of our collections, but though it bears the severe cold of Pekin, it has not hitherto been successfully cultivated with us out of the stove. It requires a deep cistern with a considerable depth of mud for its roots. The seeds preserve their vegetative life for many years.

CYANA, Reneal. See *GENTIANA pneumonanthe*.

CYANA, in *Ancient Geography*, a town of Asia Minor, in Lycia, according to Pliny. It has been episcopal.

CYANEÆ, or CYANEAN *Islands*, islands or rather islets of the Euxine sea, at the mouth of the Bosphorus of Thrace, one lying on the coast of Europe, another on the coast of Asia, at the distance of about 20 stadia. At present they are very small rocks, so that their size has probably been diminished by the attrition of the waters. These rocks were also called "Symplegades," because they appeared to be united or joined, according to the place from which they were viewed. Being more or less visible, as the north or south wind raises or lowers the waters in this part, the Greeks, always inclined to the marvellous, have supposed that these islands were floating, and very dangerous to imprudent or inattentive mariners. On one of these rocks, that near the coast of Thrace, the Romans erected an altar to Apollo; which, at Constantinople, is improperly called "Pompey's pillar."

CYANECULA, in *Ornithology*, a name given by Brisson to the blue-throated warbler, or *MOTACILLA Suecica*; which see.

CYANELLA, in *Botany*, (diminutive of *κυανος*, blue, alluding to the colour of the flowers.) Linn. Gen. 420. Schreb. 568. Willd. 641. Gært. 79. Juss. 53. Vent. 2. 164. Class and order. *hexandria monogynia*. Nat. Ord. *Coronarie*. Linn. *Aphodeli*. Juss. *Liliacea*, Vent.

Gen. Ch. *Cal.* none. *Cor.* Petals six, cohering by their claws, oblong, concave, spreading; the three lower ones hanging forwards. *Stam.* Filaments six, contiguous at the base, very short, somewhat spreading; the lower one declined, and twice the length of the others; anthers oblong, erect, dehiscent at the tip, with four obtuse teeth. *Pist.* Germ. trigonous, obtuse; style trifid, declined, the length of the lowest stamen; stigma rather acute. *Peric.* Capsule roundish, three-turrowed, three-celled, three-valved. *Seeds* several, oblong.

Ess. Ch. Corolla with six petals, three lower petals hanging forward; lowest stamen declined, longer than the others.

Sp. 1. *C. capensis*. Linn. Sp. Pl. Mart. 2. Lam. 1. Willd. 1. Jacq. Hort. 3. 21. tab. 35. Gært. tab. 17. fig. 7. Lam. Ill. Pl. 239. Bot. Mag. 568. Bot. Rep. tab. 141. (*Phalangium*; Pluk. tab. 434. fig. 2.) "Stem leafy, panicled; racemes divaricated; leaves lanceolate, undulated." Root a bulb. *Leaves* chiefly from the root, acute, smooth, sheathing the stem. *Stem* six or seven inches high, almost naked, branched, with a short lanceolate acute leaf at the foot of each branch. *Flowers* purple, with a tinge of violet, in short lax racemes; pedicels rather long, almost

almost horizontal; anthers yellow, five very short, erect, incurved, the sixth longer, grooved; style incumbent on the longer anther. The bulbs, which are about the size of those of *crocus verna*, are said to be esculent when roasted. A native of the Cape of Good Hope, at the foot of the Table mountain. 2. *C. orchidiformis*. Willd. 2. Jacq. Ic. Rar. 2. tab. 447. "Stem branched; racemes erect; stem-leaves sword-shaped, stiff and straight; root ones egg-shaped." Leaves glaucous, cartilaginous, and finely toothed at the edges. *Flowers* violet-purple; three of the petals and three of the stamens erect, the three others of each deflexed. A native of the Cape of Good Hope. 3. *C. lutea*. Linn. jun. Supp. 205. Mart. 1. Lam. 2. Willd. 3. Thunb. Act. Holm. 1794. tab. 7. fig. 1. "Scape somewhat branched; racemes erect; leaves linear-lanceolate, flat." *Flowers* yellow, larger than those of *C. capensis*, with longer peduncles; filaments united at the base, as in that species, but three of them erect, and three, one of which is longer, deflexed. A native of gravelly inundated fields at the Cape of Good Hope. 4. *C. alba*. Linn. jun. Supp. Mart. 3. Willd. 4. Thunb. Act. Holm. 1794. tab. 7. fig. 2. "Scape one-flowered; leaves filiform." A filiform bract at the middle of the scape. All the stamens erect, except the larger one. A native of the Cape of Good Hope.

CYANELLA, in *Entomology*, a species of CRYPTOCEPHALUS.

CYANELLA, in *Ornithology*, a species of EMBERIZA.

CYANEUS, in *Ancient Geography*, a river of Asia, in the territory of Colchis, now called *Clanis*.

CYANEUS, in *Zoology*. See COLUBER.

CYANOIDES, in *Botany*, Dod. See CENTAUREA *muricata*, n. 125.

CYANOMETER, (from *κυανός*, *cæruleus*, *azure*, and *μέτρον*, *mensura*, *a measure*.) is the name given by M. de Saussure to an instrument which he contrived, for the purpose of estimating the intenseness of the blue colour of the sky. This instrument is nothing more than a circular band of paper, or paste-board, divided into 51 parts, each of which is painted with a different shade of blue; beginning with the deepest, which is mixed with black, and gradually proceeding to lighter and lighter shades, as far as the lightest, which is mixed with white. By alternately looking at the sky and at the different shades of blue on this instrument, one may easily determine which shade of the latter agrees with the actual colour of the sky; and thus the various intenseness of the aerial blue, as it appears at different times, or from different altitudes above the surface of the earth, may be ascertained, compared, &c.

That the blue colour, which we observe in the heavens, belongs to the atmosphere of the globe we inhabit, is easily proved from evident facts; the principal of which are, that the higher the observer is situated, the darker does the colour of the sky appear to be. M. de Saussure finding that it corresponded with a deeper shade of blue on his cyanometer, the higher he ascended above the surface of the earth; hence concludes, that, at a certain height, the blue will disappear altogether, and the sky will appear black, *viz.* it will reflect no colour whatever.

Another proof of the blue colour being reflected by something below the moon, (and that something can be nothing else besides the air of our atmosphere,) is that when the moon is in her quadratures, or nearer to the sun, that part of it which is not illuminated by the sun will appear blue like the rest of the sky, to an observer who directs his eye to it in the day-time; whereas, if the blue was reflected by

something beyond the moon, the above-mentioned part of the moon would not appear of that colour.

This blue colour of the sky is supposed to be produced by the blue, indigo, and violet rays being more easily reflected than the other component rays of white or solar light. And it has been observed, that the colour of the sky becomes always lighter, in proportion to the quantity of aqueous vapour that happens to be mixed with the air: whence it evidently appears, that the colour of the sky is owing to the reflection from those vapours. And it also appears, that, by the use of the cyanometer, an attentive observer may be enabled to guess pretty nearly at the quantity of water actually dissolved in the air; on which account, the cyanometer ought to be added to the barometer, thermometer, and other instruments of a meteorological observatory.

CYANUS, in *Botany*, Tourt. Juss. Vent. Gært. See CENTAUREA.

CYANUS *athiopius*; Pluk. See PROTEA *cyanoides*.

CYANUS *alpinus*; Bocc. See CENTAUREA *uniflora*.

CYANUS *arborescens altera*; Alp. See STÆHELINA *arborescens*.

CYANUS *arborescens minor*; Breyn. See EUPATORIUM *divaricatum*.

CYANUS *caule uniflora*; Hall. See CENTAUREA *montana*, n. 47.

CYANUS *centauroides frutescens*; Breyn. See PTERONIA *oppositifolia*.

CYANUS *eruca folio*; Barr. See CENTAUREA *romana*, n. 84.

CYANUS *foliis ellipticis dentatis*; Hall. See CENTAUREA *lingitana*, n. 131.

CYANUS *foliis imis ellipticis*; Hall. See CENTAUREA *cyanus*, n. 48.

CYANUS *foliis pinnatis*; Hall. See CENTAUREA *scabifolia*, n. 62.

CYANUS *foliis subhirsutis*; Hall. See CENTAUREA *phrygia*, n. 68.

CYANUS *hortensis*; C. Bauh. See CENTAUREA *cyanus*, n. 48.

CYANUS *montanus caule folioso*; Bocc. See CENTAUREA *montana*, n. 47.

CYANUS *montanus latifolius*; C. Bauh. See CENTAUREA *montana*, n. 47.

CYANUS *major*; Lob. Blackw. See CENTAUREA *montana*, n. 47.

CYANUS *orientalis major*; Morif. See CENTAUREA *moschata*, n. 5.

CYANUS *repens*; Lob. See CENTAUREA *amara*, n. 19.

CYANUS *repens angustifolia*; C. Bauh. See STÆHELINA *frutescens*.

CYANUS *repens latifolius*; C. Bauh. See CENTAUREA *amara*, n. 19.

CYANUS *segetum*; C. Bauh. See CENTAUREA *cyamus*, n. 48.

CYANUS *spinosus*; Alp. See CENTAUREA *spinosa*, n. 53.

CYANUS *vulgaris*; Lob. Blackw. See CENTAUREA *cyanus*, n. 48.

CYANUS, in the *Natural History of the Ancients*, is used to express two different substances. The one, the *lapis lazuli*; the other, the *lapis armenus*, a substance used by the painters in its native state, and very improperly called *azilone*, being a mere earth, and being truly to copper, what yellow ochre is to iron.

CYANUS, in *Ornithology*, a name given by Bell., Gessn., Aldr.,

Aldr., Ray, and Will., to the solitary sparrow of Edwards, and blue thrush of Latham; the *Turdus cyanus* of Gmelin; which see.—Also, a species of *PARUS*; which see.

CYANUS, in *Zoology*. See *MUS*.

CYARDA, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

CYATHEA, in *Botany*, (from *κύπελος*, a cup,) Smith A&T. Taurin. 1793, vol. 5. 414. Tracts, 251. Clafs and order, *cryptogamia filices*. Nat. Ord. *Filices*, Linn. Juss.

Gen. Ch. Fructification scattered, roundish, standing in an hemispherical calyx, which bursts at the top without an operculum.

Eff. Ch. Involucrum going under the receptacle of the capsules, either entirely like a cup, or partially on one side.

Sp. 1. *C. horrida*. (*Polypodium horridum*; Linn. Sp. Pl. 57. *Filix ramosa*; Pet. Fil. 50. tab. 5. fig. 1. *F. latifolia ramosa*; Plum. Amer. 3. tab. 4.) "Trunk thorny; frond bipinnated and pinnatifid; segments acuminate, serrated at the tip, flowering near the margin, furnished with interramifying veins at their base. A native of Hispaniola and Jamaica. 2. *C. multiflora*. "Trunk unknown; frond bipinnated and pinnatifid; segments obtuse, serrated; stalk winged; flowers scattered; calyx torn." A native of Jamaica, communicated by sir Joseph Banks. 3. *C. arborea*. (*Polypodium arboreum*; Linn. Sp. Pl. 55. *Filix arborescens*; Plum. Fil. 1. tab. 1. Am. 1. tab. 1, 2. Pet. Fil. 41. tab. 1. fig. 1, 2.) "Trunk arborescent, scaly; frond bipinnated; leaflets sessile, serrated, with many flowers at their base; calyx entire." A native of Jamaica. 4. *C. capensis*. (*Polypodium capense*; Linn. jun. Supp. 445.) "Frond tripinnated; leaflets sessile, acute, serrated, bearing a solitary flower at their base; calyx torn." A native of the Cape of Good Hope. 5. *C. fragilis*. Smith Flor. Brit. 1. Eng. Bot. 1587. (*Polypodium fragile*; Linn. Sp. Pl. 51. Bolt. Fil. 50. tab. 27. and 46.) "Frond bipinnated; leaflets pinnatifid, sharply and deeply serrated; fructifications a little distant; calyx torn; common stalks winged." Root perennial, tufted, crowned with brown scales. Fronds from four inches to a foot high, delicate and tender, lanceolate, acute, smooth, bright green; stalk blackish, smooth, brittle; leaflets alternate, cut, most frequently pinnatifid, sometimes inversely egg-shaped, more generally lanceolate, pointed, with more or less zig-zag nerves; dots of fructification numerous, alternate, brown or black, not confluent except when old. Involucrum cup-shaped, bursting laterally, jagged, at length reflexed and obliterated. No fern varies more in the number, form, and breadth of its subdivisions. When large, most compound and finely cut, it is the *polypodium rheticum* of British writers, but not of Linnæus. When smaller and less compound, it is the *P. ilvense* of Ray's Synopsis. Dr. Smith. A native of rocky places and buildings in the mountainous parts of Britain, and the continent of Europe. 6. *C. regia*. Smith Flor. Brit. 2. (*C. incisa*; Eng. Bot. 163. *Polypodium regium*; Linn. Sp. Pl. 52. *Adiantum nigrum*, *pinnulis cicutarie divifura*; Rai. Syn. 126.) "Frond bipinnated; leaflets lobed, obtuse, without a bristly point, quite entire at the edges; calyx torn; stalk slightly winged." Root perennial, scaly. Fronds four or five inches long, lanceolate, smooth, fine green; dots of fructification nearly as in the preceding species, but smaller. A native of France and Britain, on walls and alpine rocks, but rare. 7. *C. dentata*. Smith Flor. Brit. 3. Eng. Bot. 1588. (*Polypodium*; Dickf. Crypt. Fasc. 3. 1. tab. 7. fig. 1.) "Frond generally bipinnated; leaflets egg-shaped, obtuse, deeply

and bluntly toothed, pointless." About the size of the preceding. Fronds lanceolate, acute, smooth; leaflets with zig-zag nerves; common stalk winged only towards the top; dots of fructification numerous, approximate, some becoming confluent; involucrum half way round, fringed. Rocks in Wales, and the Highlands of Scotland. 8. *C. montana*. (*Polypodium*; Allion. Ped. 2410.) "Frond in three divisions, each bipinnated and pinnatifid; segments slightly crescent-shaped, toothed at the tip; stalk winged; flowers scattered; calyx torn." A native of the Alps of Europe.

Obs. We are authorised by Dr. Smith to state, that his idea of this genus has not been understood by some German botanists, who have taken the less certain species (*fragilis*, *regia*, &c.) as examples of the genus, and thence made a new genus of the primary cyatheæ (*arborea*, &c.). We are happy to add, that Dr. Smith has in contemplation a full investigation of the subject, which will be presented to the Linnæan Society, and doubtless in due time be published in their Transactions.

CYATHODES, Rudge, Linn. Transf. 8. 293. See *STYPHELIA*.

CYATHUS, from *κύειν*, to pour out, in *Antiquity*, a liquid measure among the Romans, being the twelfth part of the sextarius. It only held as much as a man could easily drink at one draught, and was divided into twelve parts, called uncie.

CYATHUS, in *Botany*, Hall. Juss. See *NIDULARIA*.

CYATHUS, in *Ancient Geography*, a river of Greece, in Ætolia, near the town of Arfinoë.

CYAXARES I., in *Biography*, king of the Medes, who succeeded his father, Phraortes, B. C. 635, was a prince of great courage, extraordinary abilities, and devoted to the military profession. In the preceding reigns, much of the kingdom had been conquered by the Assyrians; but, by the prowess and skill of Cyaxares, it was retaken. He not only defeated his enemies in a battle, on which almost every thing depended, but laid siege to Nineveh their capital. Scarcely, however, had he attained this object, when the Scythians successfully invaded his country, and made themselves masters of Media, and a great part of Upper Asia, which they held for nearly 30 years. Wearied of their oppression, Cyaxares resolved to free himself from them by stratagem. He accordingly invited them to a general feast, which was given in every family; and when they were off their guard by intoxication, he caused a massacre to take place, and thus freed himself from his enemies. He then attacked the Lydians for having aided or succoured the fugitive Scythians. These, however, were not easily subdued; and after five years' war, which was carried on with various success, a most obstinate engagement took place: but a total eclipse of the sun, which happened during the heat of battle, had so powerful an effect on the superstition of both parties, that with one accord they retreated: peace was concluded, and a marriage was brought about between the daughter of the Lydian king and Alyages, the eldest son of Cyaxares. This business being settled, Cyaxares entered into a strict alliance with Nebuchadnezzar, king of Babylon; and, in conjunction with his new friends, he resumed the siege of Nineveh, slew Sarac the king, and levelled that proud metropolis with the earth. This important circumstance gave rise to the great successes of the allied monarchs, and laid the foundation of the collateral empires of the Medes and Babylonians. Enriched with the plunder of very many subjugated nations, they divided their forces, Nebuchadnezzar pursuing his conquests in the west, and Cyaxares falling upon the provinces of Armenia, Pontus,

and Cappadocia, which he subdued with great slaughter of the inhabitants. After these achievements, the armies united again, and completed the conquest of the Assyrian empire. Cyaxares died in the 40th year of his reign, and was succeeded by Astyages; upon whose death, in 560 B. C.,

CYAXARES II., son of Astyages, and uncle to Cyrus, succeeded to the throne. This prince is supposed to be the same with "Darius the Mede," mentioned in the Old Testament. In concert with his nephew, Cyaxares, after the reduction of Babylon, arranged the affairs of the new empire, and divided it into 120 provinces, which were entrusted to the care of those persons who had distinguished themselves during the war, over whom three presidents were appointed; the prophet Daniel, on account of his age, experience, and great wisdom, being the chief. Cyaxares reigned in conjunction with Cyrus till the year 536 B. C., when he died. *Univ. Hist. Xenoph.*

CYBEA, in *Antiquity*, a kind of ship used in commerce, of a roundish form.

CYBASSUS, in *Ancient Geography*, a town of Asia Minor, in Caria. *Steph. Byz.*

CYBATE, **WASITH**, a town of Asia, upon the right bank of the Tigris, S.E. of Seleucia, and N.W. of Apamea.

CYBELE, in *Mythology*, a heathen goddess; who, according to the Roman mythology, was the daughter of Cælus and Terra, or heaven and earth, wife of Saturn, and mother of the gods.

The Greek mythologists pretend that she sprang from one of the stones used by Deucalion and Pyrrha for re-peopleing the earth after the deluge. The Phrygians affirm that she was daughter of their first king Meon, debauched by Attys, whom her father caused to be put to death; and that she afterwards wandered with Apollo to the country of the Hyperboreans. Cybele, as the Phrygian fable reports, on occasion of the death of Attys, was seized with phrenzy, and filled the woods and mountains, wherever she went, with her lamentations. A plague soon after laying waste the country, the oracle, which was consulted, advised to bury Attys with great pomp, and worship Cybele as a goddess; but his body, which had been thrown to wild beasts, not being found, they made a statue of him, which they attended with howlings and funeral ceremonies. A magnificent temple was erected to Cybele in the city of Pessinus; and lions were placed at her feet, in commemoration of her having been nursed by these animals, when exposed in her infancy on mount Cybelus. The worship of the earth was very ancient, and the origin of it has been sought in Phrygia; for it was not received in Europe till the time of Cadmus, who transferred it from Asia; and Dardanus, it is said, who was contemporary with Cadmus, repaired with Cybele, represented as his filter-in-law, and Corybas his nephew, into Phrygia, where they introduced the mysteries of the goddess Earth, or great mother goddess, to whom was given the name of Cybele, as was that of Corybas to the Corybantes, her priests. In Italy this deity was unknown till the time of Hannibal; when the Romans, consulting the Sibylline oracles, found that this formidable enemy could not be expelled unless they brought the Idæan mother, or Cybele, to Rome. The senate, therefore, dispatched ambassadors to Attalus, king of Phrygia, and obtained from him the statue of this goddess, which was of stone, at the city of Pessinus, in Galatia. Accordingly she was brought to Rome, with singular ceremonies, and introduced, according to the Sibylline order, by the best man of the city, whom the senate adjudged to be Publius Scipio.

Cybele, besides other appellations by which she was distinguished, was named Cubebe, because her priests, when seized with their frantic fits, used to throw themselves on their beads; from the Greek verb *κυβηβαιν*, in caput pro- volvi.

She was also adored under the names of Ops, Rhea, Vesta, the Good Goddess, Dydime, Berecynthia, &c. and was called Cybele from mount Cybelus in Phrygia. She is represented in a chariot drawn by four lions, her garments flowered, a key in her hand, and a turret on her head.

Allegorists by Cybele mean the earth, and her crown of towers they consider as an emblem of the towns and cities built upon it; the key held in her hand denotes that the earth, which the winter, as it were, locks up, begins to open in the spring; and her garment, variegated with different flowers, is a symbol of the earth beautifully enamelled with these productions; the lions that draw her chariot signify her empire over all sorts of animals which she produces and cherishes; she rides in a chariot, because, as it is fancifully said, the earth is suspended in the air; and the chariot is supported by wheels, because the earth is a revolving body. Under the character of Vesta, she is generally represented upon ancient coins in a sitting posture, with a lighted torch in one hand, and a sphere or drum in the other. Varro, cited by St. Austin, (*De Civ. Dei*) gives the following explanation of the appellation and attributes of Cybele: she is called the mother of the gods; the drum, which is ascribed to her, represents the globe of the earth; the turrets, its towns and cities; the seats that surround her shew, that she only stands still when all things are in motion around her; her eunuch priests denote, that the earth must be manured in order to produce corn; their agitations before the goddess teach husbandmen, that they must not lie still; the sound of cymbals denotes the noise of the instruments of husbandry; and the tame lions intimate, that there is no soil so wild and barren, that may not be manured. Eusebius and some others are of opinion, that Cybele was a woman famous for her skill in remedies against distempers to which young children are subject, and that all the stories relating to her are grounded on this faculty which she possessed.

Cybele had her peculiar priests, ceremonies, and sacrifices. Her priests were called, in the Phrygian language, Cubeboi; the Greeks and Latins named them Cabiri, Curetes, Corybantes, and Galli, from the river Gallus, which flowed through Pessinus above mentioned. They were also styled Idæi Dactyli. The ceremonies performed by these priests in honour of the goddess were these: at stated times they carried her statue about the streets, dancing and skipping round it; and after having by violent gesticulations worked themselves into a kind of phrenzy, they began to cut and slash their bodies with knives and lancets, in commemoration of the grief of Cybele at the loss of her beloved Attys. The victims immolated in honour of the Phrygian goddess were bulls, or she-goats, whence the sacrifice was called "Taurobolium," or "Criobolium." At Rome a sow was annually sacrificed to her; and the ceremony was performed by a priest and priests sent for out of Phrygia on that occasion. Her priests (at least those designated by the name of Galli) were all eunuchs, in memory of Attys, who was said to have deprived himself of his virility; and the waters of the river Gallus were supposed to inspire them with such frantic enthusiasm, that they unreluctantly performed the necessary operation on themselves. They were forbidden wine, because Attys, overcome with it, disclosed his amours with Actæis, which he had before carefully concealed.

concealed. They abstained from bread, in commemoration of the long fast which Cybele kept after the death of Attys. They held all oaths to be unlawful; and after their death, these priests were placed on a stone 10 cubits high. The rites of Cybele were not less infamous for their lewdness than for their cruelty. Her festivals were celebrated with a confused noise of timbrels, pipes, and cymbals; and accompanied with howlings, and obscenity both of language and gesture. The animals sacrificed to her were the bull, goat, and sow, as symbols of fecundity; and the box and pine were sacred to her:—the former, because the pipes used at her festival were made of that wood; and the latter, for the sake of Attys, or Atys, the Phrygian youth, already mentioned, who was beloved by her, and made president of her rites, but who, having violated a vow of chastity, was turned by her into the pine-tree.

Cybele was one of the chief goddesses among the ancient Gauls, and particularly venerated in the city of Autun, where her priests were castrated in honour of her, and hence called Galli. However, if the worship of Cybele was introduced into Gaul, it was either by force, or in servile imitation of that of the Greeks and Romans. Such was the abhorrence with which the Gauls regarded all mutilations, that they would never voluntarily have adopted a kind of worship, which required every priest, and encouraged every votary of the goddess, to become an eunuch. Besides, the Galli were held in such abhorrence, that no other people would maintain any intercourse with them; and they were placed on a level with forcerers, gladiators, and executioners; so that they subsisted merely by carrying about their goddess, and begging charity for her sake:—a discipline which was entirely opposite to the genius of the Gallic nation. Indeed, St. Jerome intimates, that the Romans forced this emasculated priesthood upon the Gauls, and called these eunuchs Galli, in order to fix a perpetual ignominy upon that nation, for having taken their metropolis, and besieged their capitol.

CYBELE, *Mons*, in *Ancient Geography*, a mountain of Phrygia, which gave name to Cybele, the mother of the gods. We may infer that this mountain was not far from Cœlœne, towards the source of the Meander, from a verse of Ovid:

“—Viridem Cybelan atlasque Cœlœnas.”

CYBELEIA, a town of Asia Minor, in Ionia; probably the same with *Cybellia* of Strabo.

CYBELICUM ΜΑΡΜΟΡ, a name given by the ancients to a species of marble, dug in a mountain of that name in Phrygia. It was of an extremely bright white, with broad veins of a blueish black.

CYBISTRA, in *Ancient Geography*, a town of Asia, in Lesser Armenia, reckoned by Hierocles in the number of episcopal cities in the second Cappadocia. It was situated south of mount Argeus.

CYBOMANTIA, a species of divination performed by lots.

CYBRASA, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

CYBUS, a town of the Phœnician Libya, belonging to the Ionians. Steph. Byz.

CYCAS, in *Botany*, (κυκας; Theoph. the name of a palm, said to grow in Ethiopia.) Linn. Gen. 1222. Schreb. 1699. Juss. 16. Vent. 2. 68. Class and order, *palmæ pinnatifolia*, Linn.; but afterwards removed by him to filices. *Diacia polyandria*, Jacq. Nat. Ord. Filices, Juss. Vent. *Palmæ*, Lam.

Gen. Ch. *Male flowers* in a terminal oval-oblong catkin,

resembling a strobile. *Cal.* Scales imbricated, fleshy, spatulate or oval, ending in a weak point. *Cor.* none. *Stam.* Filaments none; anthers numerous in each scale. *Female flowers* on a separate plant. *Fronds* numerous, terminal, somewhat compressed below, dilated above, clustered. *Pist.* Germs sessile, on the edges of the frond; style short; stigma simple, permanent. *Peric.* Drupe egg-shaped; outer coat fleshy; nut woody, one-celled; kernel rounded, firm.

Ess. Ch. *Male catkin* resembling a strobile. *Anthers* numerous, sessile. *Females.* *Fronds* numerous, terminal, somewhat compressed below, dilated above. *Drupes* sessile, on the edges of the frond.

Obs. This genus and zamia seem to constitute an intermediate order between the ferns and the palms. They resemble the former in the mode of their foliage; but, in other respects, have all the proper characters of a palm. Linnæus erroneously describes the pollen of cycas as naked, i. e. not enclosed in an anther.

Sp. 1. *C. circinalis*. Linn. Sp. Pl. Mart. 1. Lam. 1. Ill. Pl. 891. (Toda-pana; Rheed. Mal. 3. 9. tab. 13—21. Rai Hist. 1360. Oius calappoides; Rumph. Atob. 1. 86. tab. 22, 23. Arbor zagoe amboinensis; Seb. Thes. 1. 39. tab. 25. fig. 1.) “Leaves pinnated; leaflets linear, flat, not pungent at the tip, slightly curved outwards; common petioles prickly beneath the leaflets.” *Trunk* thick, generally short, scaly; sometimes from fifteen to twenty feet high, with numerous annular protuberances, and divided at the summit into a very few short branches. *Leaves* crowning the trunk, three feet long or more; leaflets numerous, very near together. *Male catkins* terminal, within the leaves, solitary, sometimes very large, fleshy, having some resemblance to a large pine-apple. *Fronds* bearing the *females* numerous, terminal, within the leaves, coriaceous, woolly, sword-shaped, expanded upwards, indented at the edges about the middle, jagged near the summit, and ending in a long sharp point. *Fruit* about the size of a small orange, reddish-yellow, slightly compressed. A native of the East Indies, and of the islands in the South Sea. 2. *C. revoluta*. Mur. Syst. Veg. 2. Mart. 2. Lam. 2. Thunb. Flor. Jap. 229. Smith. Linn. Trans. 6. 312. tab. 29, 30. (Tessio; Kœmpf. Amœn. 897. Arbor calappoides titsjin dicta; Rumph. Amb. 1. 92. tab. 24.) “Leaves pinnated; leaflets narrow, revolute at the edges, slightly curved inwards, pungent at the tip; common petioles prickly underneath the leaflets.” *Trunk* cylindrical, branched, five feet high or more, nine or ten inches in diameter, brown, very scaly with the remains of old petioles. *Leaves* four or five feet long, crowning the trunk, and forming a magnificent bason ten or twelve feet broad at the top. *Fruit-bearing fronds* numerous, terminal, within the leaves, forming a kind of strobile or cone, at first hollow like a bird’s-nest, finally rather convex; from six to eight inches long, fleshy, entirely covered with a pale brown woolly down; flattish and stalk-like towards the bottom; bearing on each edge about the middle a row of three or four sessile drupes; dilated at the extremity into a pinnatifid, or rather palmate many-fingered leaf, whose lobes are generally turned inwards, and tipped with a spine. *Fruit* nearly as large as an apricot, of a rich orange hue, and clothed with a woolly down which easily rubs off, somewhat obovate or elliptical, a little compressed, tipped with a minute rigid point formed of the permanent stigma; outer coat coriaceous; nut elliptical, hard, whitish, tipped with a point connected with the stigma, and internally lined with a loose brown membranous integument, closely enfolding a white, firm, uniform kernel, which completely occupies the shell, and consists entirely of albumen. A native of Japan. This species

Species produced fruit, for the first time in England, in the autumn of 1799, at Farnham castle in Surrey, the seat of the honourable and right reverend Dr. North, bishop of Winchester, where it was seen by Dr. Smith, from whose accurate description the preceding one is abridged. The kernels of both these species are eaten in their native countries; and from the pith of both a kind of fago is made, which is said to be very nutritive, but not equal to that which is produced by the tree fagoe palm, metroxylon of Rottböll, and fagus of Gärtner, La Marek, and Ventenat. Linnæus confounded the two plants. 3. *C. inermis*. Lour. Cochin. p. 632. "Leaves pinnated; common petioles without prickles." *Trunk* five feet high, the thickness of the human thigh, quite simple, brown, rugged. *Leaves* five feet long, ascending; leaflets linear-lanceolate, six inches long, smooth, dull green, flattish, sessile. *Male catkin* strobile-shaped, four inches in diameter, terminal, solitary, erect, oval-oblong, brownish-yellow, imbricated, rather close; scales oblong-top-shaped, thick, fungous; anthers more than a hundred in each scale, the size of rape-seed, globular, dehiscant at the tip. *Fruits of the female flowers* various, linear, reflexed, few-flowered, nearly terminal, simple, dilated and jagged near the top. *Fruit* an inch and half long, egg-shaped, somewhat compressed, smooth and even, red. Found wild and cultivated for its beauty in Cochinchina and China, but no part of it used for food. In Tonquin a tolerable fago is said to be obtained from the pith.

CYCEON, from *κράσιον*, to mix; a name given by the *Ancient Poets and Physicians* to a mixture of meal and water, and sometimes of other ingredients. These constituted the two kinds of *cyceon*; the coarser being of the water and meal alone; the richer and more delicate composed of wine, honey, flour, water, and cheese. Homer, in the eleventh Iliad, talks of *cyceon* made with cheese and the meal of barley, mixed with wine, but without any mention either of honey or water; and Ovid, describing the draught of *cyceon* given by the old women of Athens to Ceres, mentions only flour and water. Dioscorides understood the word in both these senses; but extolled it most in the coarse and simple kind: he says, when prepared with water alone, it refrigerates and nourishes greatly.

CYCESIUM, in *Ancient Geography*, a town of Greece, in the Peloponnese, plac'd by Strabo near the fountain Bifa.

CYCINNIS, a Grecian dance, so called from the name of its inventor, one of the satyrs belonging to Bacchus. It consisted of a combination of grave and gay movements.

CYCLADES, from the Greek word *κύκλος*, a circle, in *Ancient Geography*, a cluster of islands in the Ægean sea, forming a kind of circle round Delos, though this is not strictly the case, as most of them lie S. of Delos: called *Minioides* by Apollonius. The number and order of these islands, according to Strabo, are as follow: Helena, Ceos, Cythnus, Seryphus, Melo, Siphnus, Cimois, Prepeinthus, Olearus, Naxus, Parus, Syrus, Myconus, Tenus, Andrus, Gyarus, which see respectively.

CYCLAMEN, in *Botany*, (*Κυκλαμίνος*: Diosc. From *κύκλος*, circular; referring to the round form either of the leaves or of the roots.) Sowbread. Linn. gen. 201. Schreb. 262. Willd. 293. Lam. Ill. 281. Juss. 97. Vent. 2. 290. Class and order, *pentandrii monogynia*. Nat. Ord. *Preciæ*, Linn. *Lyfsmachia*, Juss. *Primulaceæ*, Vent.

Gen. Ch. *Cal.* half five-cleft; segments egg-shaped. *Cor.* monopetalous, wheel-shaped; tube very short, somewhat globular, border very large, bent backwards, five-

parted, segments linear-lanceolate; orifice of the tube prominent. *Stam.* Filaments five, very small, within the tube of the corolla; anthers straight, acute, converging, *Pist.* Germ superior, roundish; style filiform, straight, longer than the flaments; stigma acute. *Peric.* Berry capsular, globular, one-celled, dehiscing at the top in five directions. *Seeds* numerous, somewhat egg-shaped, angular, attached to an egg-shaped free receptacle.

Eff. Ch. Corolla wheel-shaped; tube very short, with a prominent orifice; border reflexed. Stamens within the tube. Berry covered with a capsule.

Sp. 1. *C. coum*. Hort. Kew. 1. Mart. 1. Bot. Mag. 4. "Leaves orbicular, heart-shaped, quite entire." *Leaves* flat, smooth and of a lucid green above, very red underneath in the beginning of winter, but the colour goes off gradually in the spring; petioles short, weak. A native of the South of Europe. 2. *C. europæum*. Hort. Kew. 2. Mart. 2. Willd. 2. Jacq. Antl. 5. 1. tab. 401. Scop. Carn. 2. 211. Smith. Prod. Flor. Græcæ. 442. (*C. orbiculato folio inferne purpurascens*; Bauh. pin. 308. Tourn. 154) "Leaves orbicular, heart-shaped, crenate." *Root* tuberous. *Stem* very short, within the ground. *Leaves* deep green and spotted above, commonly reddish purple underneath, smooth, on very long red petioles. *Flowers* drooping, purple, sweet-scented; peduncles resembling the petioles, erect with the flower, spiral with the fruit. *Capsular berry* coriaceous, purple, opening first at the top, and then entirely. *Seeds* large, rufous, kidney-shaped. A native of Austria. 3. *C. persicum*. Hort. Kew. 3. Mart. 3. Willd. 3. Prod. Fl. Græc. 443. Bot. Mag. 44. "Leaves oblong-ovate, heart-shaped, crenate." *Leaves* stiff, with purple veins underneath; petioles near six inches long, purple, strong, fleshy. *Flowers* pure white, with a bright purple bottom; sometimes entirely white and very fragrant. A native of Greece, frequent about Athens. 4. *C. hederifolium*. Hort. Kew. 4. Mart. 4. Willd. 4. Bot. Mag. 1001. Bauh. pin. 308. Flor. Græc. tab. 185. (*C. europæum*; Mill. Diet. Smith Eng. bot. 548. Flor. Brit. 1. 224.) "Leaves heart-shaped, angular, finely toothed." *Root* a large roundish knob, throwing out several branched fibres. *Leaves* veined, smooth, stained above with white sinuated spots, purplish underneath; petioles long, cylindrical, zig-zag, slender at the base. *Flowers* drooping, either white or purplish; segments upright, twisted; peduncles longer than the petioles. After impregnation the peduncles curl in a close spiral manner, and bury the ripening fruit in the ground, or lay it close to the surface among the leaves. A native of Italy and Greece. It has been found growing, apparently wild, on a bank in the parish of Bramfield, Suffolk, and has been admitted by Dr. Smith into the British Flora, but, as he himself observes, it can scarcely be thought really indigenous. 5. *C. repandum*. Smith Prod. 445. Flor. Græc. tab. 186. (*C. radice calliææ magnitudinis*; Bauh. pin. 308. Tourn. 155.) "Leaves heart-shaped, repand." A native of the country about Constantinople. 6. *C. inlicum*. Linn. Sp. Pl. 2. Mart. 5. Lam. Enc. 2. Ill. 1561. Willd. 5. "Border of the corolla drooping." Border of the corolla not completely reflexed, but only inclined outwards. A native of the isle of Ceylon.

Propagation and Culture.—The plants of this genus admit of but little increase by the roots; the best method of propagating them is by seeds, which should be sown soon after they are ripe, in boxes or pots, and covered about half an inch deep, placing them where they may have only the morning sun, till the beginning of September, when they may

may be removed to a warmer exposure. The first, second, and fourth species may be plunged into the earth close to a south wall in a mixture of bog-earth and loam, and will stand common winters with out covering, but in very severe frosts should be sheltered by mats or straw. If the season be mild the first species will flower as early as February, or much earlier by artificial heat. The third species is more tender, and requires to be treated rather as a green-house plant. None of the species should have much water after the leaves have died down.

CYCLAMEN, in *Gardening*, contains plants of the low, herbaceous, flowery, perennial tuberous-rooted kind; of which the species cultivated are: the common cyclamen (*C. Europeum*), the round-leaved cyclamen, (*C. coum*), the Persian cyclamen, (*C. Persicum*), and the fig-leaved cyclamen, (*C. hederifolium*).

Method of Culture.—All these plants may be increased by sowing the seeds in large wide pots, tubs, or boxes filled with good light mould mix'd with a little sand, in the latter end of summer or the beginning of autumn, covering them to the depth of about half an inch, exposing them at first in situations that have only the morning sun, but afterwards removing them into more warm and sunny exposures; and as the winter approaches, placing them under the protection of frames and glasses, or some other contrivance, fresh air being admitted when the weather is mild and suitable. In this way some plants of the hardy sorts will appear about the beginning of the following year, and of all the kinds in the spring. During the beginning of summer, when the weather is hot and dry, slight waterings should be given occasionally; but when their leaves begin to decline in the latter end of it, they should be removed to an eastern aspect, with only the morning sun; and as their roots are then in an inactive state, have little or no water. They should be kept free from weeds in the autumn, and have some fresh mould applied over the surfaces of the pots or tubs in which they grow, protecting them again in the winter as before, continuing the same management as in the preceding year, till the decline of the leaves in the latter part of the summer, when they should be carefully taken up, and the more hardy sorts planted out in the situations where they are to remain, as those of a warm, dry border; and the tender kinds removed into pots to have protection from frosts in winter.

As the Persian sort is the most impatient of cold and moisture, it should constantly be kept in pots filled with light sandy earth, or a compost of loam and lime-rubbish, and be placed in such situations in the frame or green-house, as to have as much free air as possible in mild weather in winter. Some of the sorts will generally begin to flower in the course of one or two years after being thus planted out; the first kind often about Christmas, which is succeeded by those of the Persian sort.

The plants in the borders should have the protection of mats, or other contrivances, in severe winters, as by such means they produce a greater abundance of flowers, and these more fair and beautiful.

The varieties of the different sorts are best preserved and continued by planting pieces of the divided roots, immediately after they have been separated in the summer season, in pots, tubs, or other places, as above: but in this mode they do not increase in an expeditious manner.

These plants are very ornamental though of small growth, in their variegated large foliage, as well as their elegant flowers, which in some of the sorts are fragrant, as those of the spring kinds.

The hardy sorts produce a fine effect in the fronts of bor-

ders, or clumps in pleasure-grounds, and those of the tender kinds among other potted plants in the green-house.

The most proper period for removing these plants for any purpose is about the beginning of June, when the leaves decline, but they should not be often removed, as the roots do not lose their fibres, as in some others of the tuberous and bulbous rooted kinds of flowers.

CYCLAMINUS SINUS, in *Ancient Geography*, a gulf of Asia Minor, in the Thracian Bosphorus, N. of the gulf *Castaneus*.

CYCLAS, in *Botany*, Schreb. Mart. See **CRUDIA**.

CYCLAS, in our *Old Writers*, a long garment, close upwards, and open, or large below. Matt. Paris, speaking of the citizens of London, tells us they were *cericis agstimentis ornati, cycladibus auri textis circumdati*. Anno 1226.

CYCLE, ($\kappa\upsilon\kappa\lambda\omicron\varsigma$, a circle of time) a periodical portion of time, constantly renewed after the expiration of the proper interval, in which certain phenomena, or events, complete their courses.

We shall here recite some of the principal cycles, with their defects and improvements. The first we shall mention is the

CYCLE, Calippic. See **CALIPPIC Period**; and **Metonic Cycle**.

CYCLE, Canicular. See **CANICULAR Year**.

CYCLE, Chinese, a period of 60 years, or of 720 revolutions of the moon, which, with the settled intercalation of 22 lunations, were at first supposed to bring a perfect coincidence of the relative positions of the sun and moon:—however, even according to this period, every new year was made constantly to recede, in a very small degree, which the Chinese afterwards, from time to time, corrected. This cycle answered a double purpose; one as an era for chronological reckoning, and the other as a regulating period for a luni-solar year. Each year of the cycle is distinguished by the union of two characters, taken from such an arrangement of an unequal number of words placed in opposite columns, that the same two characters cannot be found again together for 60 years. The first column contains a series of ten words; as, *kia, y, ping, ting, ou, ki, kong, sin, yen, koui*; the other of twelve words, *viz t'fée, tehou, yn, mao, tchen, fée, ou, ouei, chen, yeou, kiu, hui*; which last are, in reality, the same that denote the twelve hours or divisions of the day; each being double the European hour. The first word or character of the first series or column of ten words, joined to the first word of the second series or column of twelve, marks the first year of the cycle; and so on until the first series is exhausted; when the eleventh word of the second series combined with the first of the first series, marks the eleventh year of the cycle; and the twelfth or last of the second series joined with the second of the first series, serves for denoting the twelfth year. The third of the first series becomes united in regular progression with the first of the second series to mark the thirteenth year; and proceeding in this order, the first character in the first and second series cannot come again together for sixty years, or until the first year of the second cycle. Guabil says, that the year 1723 was reckoned the 40th year, or the year *koui-mao*, of the 74th sexagenary cycle, so that it is easy to ascend backwards to the commencement of the Chinese era. For 73 cycles of 60 years and the odd 59 years of the 74th cycle, amount to 4419 years, which will bring us to the year 2695 before the Christian era, or 347 years before the deluge, according to the chronology of the Hebrew text. But if, with sir George Staunton, in his "Embassy to China," (vol. ii. p. 555.) we reckon the year

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1797 the 54th year of the 68th Chinese cycle, its commencement must have been 2277 years B. C., or about 71 years after the deluge. The institution of this Chinese cycle is commonly ascribed to Hoang-ti, who lived above 300 years before Yao, the commencement of whose reign is dated by Du Halde, in the year 2357 B. C.

Cycle of *Cleostratus*, a period of eight years, or 2292 days, distributed into 99 lunations, viz. 96 of 29 and 30 days alternately, and three complete intercalary months. (Herod. l. i. c. 32 Gemin. Elem. Astr. c. 6.) This cycle was formed by Cleostratus, an astronomer of Tenedos, who flourished after Thales about the year 532 B. C. He observed, that one revolution of the sun being completed in 365 days 6 hours, was $11\frac{1}{4}$ days greater than 12 lunations of $29\frac{1}{2}$ days. These $11\frac{1}{4}$ days multiplied by 8, amount to 90 days, which are equal to three months of 30 days each. Hence he formed his cycle. This cycle, by which the Olympic games were regulated, would have been very exact, if a lunar year had consisted of $354^d 4^h 18'$; but, in reality, it consists of $354^d 8^h 48' 34''.7052$. The difference, viz. $4^h 30' 34''.7052$, in the space of eight years, would amount to $36^h 4' 37''.6416$; so that 99 lunations contain $2923^d 11^h 40' 45''.3179$. The moon, which should have been renewed at the conclusion of this cycle, was observed to be $1^d 13^h 10' 41''.3179$ distant from the time of conjunction. This error must have exceeded three days in 16 years, and 30 days in 160 years. The correction of it was attempted by succeeding astronomers. The addition of three days, which was made at the conclusion of two periods, corresponded nearly to the course of the moon, but not to that of the sun. Hence arose a confusion and perplexity, which excited the raillery of Aristophanes, in his comedy of the "Clouds." The partiality which many of the Greeks retained in favour of the cycle of Cleostratus induced Eudoxus to attempt the correction of it. He observed, that eight solar years of 365 days contained 2922 days, and that 99 lunations contained $2923\frac{1}{2}$ days. In the course of every period, therefore, the moon varied from the sun a day and a half, which amounted to a month of 30 days, in 20 periods, or in 160 years. The subtraction of this month from every 160 years constitutes the cycle attributed by Scaliger to Eudoxus. (De Emend. Temp. l. ii. p. 69.)

Cycle, *Metonic*, or lunar cycle of Meton, is a period of 6940 days, in which are very nearly completed 19 tropical revolutions of the sun, or solar years, and 235 lunations, or revolutions of the moon, with regard to the sun. After the completion of this cycle, the conjunctions of the sun and moon take place in the same degrees of the ecliptic, and consequently the new moons fall on the same days of the year as they did 19 years before.

Livy seems to ascribe the invention of this cycle to Numa Pompilius, and Geminus to Euctemon and Philippus; but the honour of it has been generally attributed to Meton, an Athenian astronomer, about 432 years before our era, for the purpose of regulating the festivals of the Greeks, which, on account of the imperfection of the calendar of that people, had gone into great confusion. The Greeks denominated it *ἑννεαδικαίτηρις*, *enneadikæteris*. It was published at the general meeting of the Greeks, assembled for the celebration of the Olympic games; and it was received with so much applause, that a statue was decreed to the inventor, and he was declared victor in the first department. The scheme of the festivals, arranged according to the new cycle, was publicly proposed, inscribed on a marble pillar in letters of gold; and hence the number which expresses the order of the current year in this cycle

is usually called the golden number. This cycle was adopted on July 16th, B. C. 433; and the new moon which happened P. M. $7^h 43'$, was the precise era of its commencement. The first day was reckoned from sun set.

The year of the Greeks consisted of 12 months of 29 and 30 days alternately; making in all a period of 354 days, which comprises very nearly 12 lunations, or full moons. This year corresponds to the mean conjunctions of the sun and moon within something less than nine hours. The great difficulty was to connect this lunar year with the revolution of the sun, so as to make the several months fall nearly in the same seasons. The Olympic games were celebrated every fourth year, during the full moon next after the summer solstice; and the year of the Greeks was so regulated as to make this the full moon of the first month. This purpose was effected by intercalations; but these were managed so injudiciously, that, in the time of Meton, the calendar and the celebration of the sacred festivals had fallen into great confusion. In the "Clouds" of Aristophanes, Diana, the goddess of the moon, is introduced greatly displeased that her course was no longer the standard by which the disposition of the festivals and the sacrifices to the gods was regulated: she complains bitterly that the deities were often disappointed of the repasts, which, on the return of the due times, they expected to receive from the devotion of their worshippers. This clearly shews the height to which the evil had reached, and proves that the necessity of mending the calendar was generally perceived; a circumstance which, while it would stimulate the exertions of ingenious men to find a remedy, would, at the same time, secure a favourable reception to a proper plan of reformation.

The Metonic cycle is recommended by its great simplicity: in this respect it is much to be preferred to any other period hitherto proposed for reconciling the motions of the sun and moon. Although it is possessed of considerable accuracy, it is yet far from being perfectly exact. An interval of 6940 days is neither precisely equal to 19 tropical years, nor to 235 lunations; it exceeds the former about $9\frac{1}{2}$ hours, and the latter about $7\frac{1}{2}$ hours. In four cycles these errors would accumulate to more than a day; and the several phases of the moon, which are very remarkable appearances, would be really observed to happen a day sooner than the times computed by the calendar. To remedy this defect, Calippus, who lived about a century posterior to Meton, proposed to cut off a day in four periods of 6940 days; and for this purpose he contrived a new cycle of 27,759 days, in which were contained 76 solar years, and 940 months or lunations. This new cycle is, in a considerable degree, more accurate than that of Meton; for it supposes the tropical year to consist of 365 $\frac{1}{4}$ days, and it is anticipated by the full moons only $5^h 53'$ in 76 years.

It is in the manner we have just been describing, that the primitive astronomy was first improved, and that a tolerably exact knowledge of the mean motions was first acquired. When the solstice, or the full moons, actually observed in the heavens, had separated from the calculated times by an interval too great to escape notice, the errors were cut off so as to bring the computations to correspond more nearly with the phenomena. And it is not difficult to conceive that, by repeated corrections of this kind, the mean motions might at length be determined with very great accuracy, without the help of nice and delicate observations, and even although astronomy, in other respects, should still continue in a rude state. This seems to be exemplified in the astronomy of the Hindoos, in which the mean motions are ascertained with great precision; at least the na-

ture of the methods employed in the astronomy of that people, favours this opinion.

The civil year, according to the calendars now in use, is entirely regulated by the motion of the sun; but certain festivals of the Christian church, such as that of Easter, do still depend upon the full moons that happen at determinate seasons of the year. The celebration of Easter, as laid down by the council of Nice in 325, is fixed for the first Sunday after the next full moon following the 21st of March; and thus our calendars, as well as that of ancient Greece, require a method of reconciling the motions of the sun and moon.

At the time this rule was established, the vernal equinox really happened on the 21st of March, and the framers of it seem to have imagined that this would always continue to be the case. The intention certainly was to make the Paschal moon depend on the vernal equinox: and if the Nicene decree mentions the day on which the equinox then happened, and not the equinox itself, without making any provision for the separation of these two events, this can only be accounted for from its not being adverted to that such a separation might possibly take place. The fathers of the council of Nice made no change in the civil year, which continued to be regulated by the Julian calendar as before. All that was then thought to be necessary for introducing into the church an uniform practice in regard to the times for celebrating the festivals was, to lay down a general rule for determining the Paschal full moon, and of course Easter Sunday. For this purpose the ancient cycle of Meton was adopted. If it be supposed that 235 lunations are precisely equal to 19 Julian years, it is plain that the Paschal full moons would happen on the same days of the month in the corresponding years of every cycle. For instance, if the Paschal full moon should fall on the 17th day of April of the fourth year of the current cycle, the same event would take place on the same day of the same month of the fourth year of all the following cycles. According to this supposition, it was only necessary to determine the Easter Sundays for one complete cycle, in order to have a perpetual table for all succeeding ages. Such was the simple scheme adopted by the church after the council of Nice; and this practice continued to be universally followed till the reformation of the calendar in 1582, and, by some of the Protestant churches, for a long time after.

But in process of time two things happened, which had not been provided for by the council of Nice, and which introduced confusion into the calendar, and a departure from the rule laid down for the celebration of Easter. The first of these was the separation of the vernal equinox from the 21st of March. In the 16th century the first full moon after the 21st of March was frequently not the first full moon after the vernal equinox, which it ought to be, according to the intention and spirit of the Nicene decree. In fact the vernal equinox, which in 325 fell on the 21st of March, in the 16th century actually happened on the 10th of the same month. This anticipation was owing to the excess of the Julian year, of 365 days 6 hours, above the actual time of a tropical revolution of the sun, which is only 365^d 5^h 48' 48". In an interval of 1300 years the 4th had anticipated the Julian calendar 10 complete days.

The second thing that happened was owing to the inaccuracy of the supposition on which the scheme for determining the Paschal full moons was founded; namely, that 235 lunations are exactly equal to 19 Julian years. The error of this supposition was precisely the same as that of the ancient period of Calippus, introduced to correct the

cycle of Meton; and it amounted to something less than a day in 304 years. In 1300 years, that elapsed between the council of Nice and the end of the 16th century, the full moons calculated by the rules of the church were later than the true full moons by nearly four days: and hence arose a distinction between the ecclesiastical full moons and the true ones.

The defects of the calendar, both in regard to the seasons and to the full moons, had been frequently the subject of discussion before the 16th century, and many plans of reformation had been proposed at different times. At last pope Gregory XIII., in 1582, accomplished the great work of reforming the calendar. As far as regarded the civil year the undertaking was neither very difficult nor very complicated. In order to bring the 21st of March to the equinox, as it was at the time of the council of Nice, 10 days were cut off, by calling the 5th day of October, 1582, the 15th of that month; and, in order to fix the equinox for the 21st of March in all time coming, three days were directed to be left out in every period of 400 Julian years, by making three consecutive centennial years common years, and the fourth a bissextile year; whereas, according to the old calendar, every centennial year was a bissextile year. This is equivalent to the supposition that 400 tropical revolutions of the sun are performed in 146,097 days; which, although it is not perfectly exact, is very near the truth. The error is in excess, and it amounts to a day in 36 centuries: and, on this account, a day extraordinary must be left out in that period of years. The first correction for this error will fall in the year 5203, which must be made a common year, although, in the general tenor of the calendar, it should be a bissextile year.

A more difficult part of the reformation of the calendar, was to connect the motions of the moon with the solar year, so as to lay down a rule sufficiently simple for determining the Paschal full moons. The scheme to which the preference was given is still founded on the Metonic cycle of 19 years, although a new set of numbers, called epacts, was introduced. By the epact of any year is understood the age of the moon on the first day of January of that year; or, it is the number of days elapsed since the last new moon. The epacts, it is evident, will be regulated by the excess of the solar year above 12 lunations, which are completed in it. Supposing a full moon to fall on the first day of January, the epact for that year would be 0; but next year it would be 11, which is the number of days that the solar year exceeds 12 lunations: the third year it would be 22: the fourth year it would be 3, namely, the excess of 33 above 30, the number of days that suffice for a lunation. In this manner the epacts for a complete cycle of 19 years are continued, by constantly adding 11 and dropping 30, when the sum exceeds that number: after which the series of numbers again recommences with a new cycle.

If 235 lunations had corresponded exactly to 19 Julian years, the series of epacts would have been perpetual, or constantly the same for every cycle: and the new calendar would have been in substance the same as the old method by the golden numbers. But this regularity of the epacts is disturbed by two causes; by the omission of the intercalary days in the secular years; and by the error of the cycle of 19 years, which amounts to a day nearly in three centuries. On the former account a day must be subducted from the series of epacts at the commencement of every century, whose first year is a common year; and on the latter account a day must be added to the same numbers after every interval of 300 years. In the language of the calendar,

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the first correction is called the solar equation, and the latter the lunar equation. It thus happens that every century, for the most part, requires a new set of epacts; at the same time it is not difficult to infer from what has just been said that the same set will sometimes continue in use for two, and even for three centuries together. If we consider further that every set of epacts is derived from the epact of the first year of the cycle, and that this is necessarily a number less than 30, it will plainly appear that all the possible sets are limited to 30. In the scheme of the Gregorian calendar, the 30 sets of epacts are arranged in a table, and they are distinguished by as many letters of the alphabet, which serve as indexes: in another table the several secular years are contained, each having the letter annexed to it, which is the index of the set of epacts to be used for the following 100 years.

According to the Gregorian calendar, the series of epacts for 1800, which is to continue in use for the 19th century, is

1,	2,	3,	4,	5,	6,	7,	8,
*,	XI,	XXII,	III,	XIV,	XXV,	VI,	XVII,
9,	10,	11,	12,	13,	14,	15,	16,
XXVIII,	IX,	XX,	I,	XII,	XXIII,	IV,	XV,
XXVI,							
18,	19,						
VII,	XVIII,						

The figures denote the golden numbers, or the rank in the cycle of 19 years, and the Roman characters the epacts: the asterisk denotes either 0 or 30. In the year 1900, which is a common year, the epacts must be all carried back a day; thus,

1,	2,	3,	4,	5,	6,	7,	8,
XXIX,	X,	XXI,	II,	XIII,	XXIV,	V,	XVI,
9,	10,	11,	12,	13,	14,	15,	16,
XXVII,	VIII,	XIX,	*,	XI,	XXII,	III,	XIV,
17,	18,	19,					
XXV,	VI,	XVII,					

And this set of epacts will remain in use for the next 300 years: for the year 2000 being a bissextile year, there is no solar equation; and the year 2100 being a common year, and at an interval of 300 years from 1800, the solar and lunar equations both take place, and, being contrary to one another, they produce no change in the epacts.

It is to be remarked that the new moons do not anticipate the cycle of 19 years quite so much as a day in 300 years. The anticipation is very nearly only 8 days in 2500 years: and hence, after having applied the lunar equation

of the epacts seven times successively, at intervals of 300 years each time, it must be applied the eighth time at an interval of 400 years.

At the time of the council of Nice, when the lunar cycle of 19 years was adopted for computing the church festivals, it would have been most convenient to have made the series of cycles to commence with the era of Christ. Had this been done, the golden number of any proposed year, or its rank in the current cycle, would have been the remainder of the division when that year was divided by 19. But this consideration was neglected in preparing the table of the Paschal full moons, which was accommodated to the state of the heavens at its formation: and, on reckoning back, it was found that the first year of our era corresponded not to the first, but to the second year of the cycle of 19 years. Hence the golden number for any proposed year will be found by this rule: "Add 1 to the year and divide by 19; the remainder of the division is the golden number sought; if there be no remainder, the golden number is 19." The only use of the golden number, in the new or reformed calendar, is to find the epact.

If it be proposed to find the golden number for the year 1808: then 1809 being divided by 19 the remainder of the division comes out to be 4, the golden number for that year. In the set of epacts in use for the 19th century, it will be found that III corresponds to the golden number 4; this then is the epact for 1808, or the age of the moon on the first of January 1808, according to the calendar: whence all the full moons for that year may readily be found.

The calendar is entirely founded on the mean motions of the sun and moon, and the new moons computed by it would have coincided with the mean conjunctions of the sun and moon, if its epoch had coincided with the astronomical epoch. This, however, is not the case: the astronomical epoch is earlier than the epoch of the calendar, and the mean conjunctions of the sun and moon precede the new moons of the calendar.

As the lunar cycle of 19 years sometimes includes five leap-years, and sometimes four, it is impossible to have a correct table of all the numbers, unless it be extended to four times 19, or 76 years, in which there are 19 leap-years without a remainder. In this case, however, it must be adapted to the old style, because, in every customary year not divisible by 4, the regular course of leap-years, is interrupted in the new style, as was the case in the year 1800. Mr. Ferguson, in his "Astronomy," (p. 264—5.) has given a table, computed upon the regular old style plan, of the mean times of all the new moons to the nearest hour for 76 years, from the year of Christ, 1724, to the year 1800, inclusive: and he has also shewn how to make this table perpetual. The table is here subjoined.

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A TABLE, shewing the Times of all the Mean Changes of the Moon, to the nearest Hour, through four Lunar Periods, or 75 Years. M signifies Morning, A, Afternoon.

Years of the Cyc.	A TABLE, shewing the Times of all the Mean Changes of the Moon, to the nearest Hour, through four Lunar Periods, or 75 Years. M signifies Morning, A, Afternoon.																								
	A.D.	January.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		October.		Novemb.		Decemb.	
		D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.
1	1724	14	5A	13	5M	13	6A	12	7M	11	8A	10	8M	9	9A	8	10M	6	10A	6	11M	4	12A	4	1A
2	1725	3	2M	1	2A	3	3M	1	4A	30	5A	29	6M	28	7A	27	8M	25	8A	25	9M	23	10A	23	11M
3	1726	21	11A	20	11M	21	12A	20	1A	20	1M	18	2A	18	3M	16	4A	15	5M	14	5A	13	6M	12	7A
4	1727	11	8M	9	9A	11	9M	9	10A	9	11M	7	12A	7	0A	6	1M	4	1A	4	2M	2	3A	31	4M
5	1728	0	6M	28	7A	29	7M	27	8A	27	8M	25	9A	25	10M	23	11A	22	11M	21	12A	20	1A	20	2M
6	1729	18	2A	17	3M	18	4A	17	4M	16	5A	15	6M	14	7A	12	7M	11	8A	11	9M	9	10A	9	11M
7	1730	7	11A	6	0A	8	1M	6	1A	6	2M	4	3A	4	3M	2	4A	2	5M	30	6A	30	7M	28	8A
8	1731	26	9A	25	10M	26	10A	25	11M	24	11A	23	0M	23	1M	21	2A	20	2M	19	3A	18	4M	17	5A
9	1732	16	5M	14	6A	15	7M	13	8A	13	8M	11	9A	11	10M	9	11A	8	11M	7	12A	6	1A	6	2M
10	1733	4	2A	3	3M	4	4A	3	4M	2	5A	30	7A	30	8M	28	8A	27	9M	26	10A	25	11M	24	11A
11	1734	23	0A	22	1M	23	1A	22	2M	21	2A	20	3M	19	4A	18	5M	16	5A	16	6M	14	7A	14	8M
12	1735	12	9A	11	9M	12	10A	11	11M	10	11A	9	0A	9	1M	7	2A	6	2M	5	3A	4	4M	3	5A
13	1736	2	5M			1	7M	29	9M	28	9A	27	10M	26	11A	25	0A	23	12A	23	1A	22	2M	21	3A
14	1737	31	6A			30	8A	18	5A	18	5M	16	6A	16	7M	14	8A	13	8M	12	9A	11	10M	10	11A
15	1738	9	11M	7	12A	9	1A	8	1M	7	2A	6	3A	5	4A	4	5M	2	5A	31	7A	30	8M	29	8A
16	1739	28	9M	26	10A	28	11M	26	12A	26	0A	25	1M	24	2A	23	3M	21	3A	21	4M	19	5A	19	6M
17	1740	17	6A	16	7M	16	8A	15	9M	14	9A	13	10M	12	11A	11	0A	9	12A	9	1A	8	2M	7	3A
18	1741	6	3M	4	4A	6	4M	4	5A	4	5M	2	6A	31	7A	30	8M	28	9A	28	10M	26	11A	26	11M
19	1742	24	12A	23	1A	25	2M	23	3A	23	3M	21	4A	21	5M	19	6A	18	6M	17	7A	16	8M	15	9A
20	1743	14	9M	12	10A	14	11M	12	12A	12	0A	11	1M	10	2A	9	3M	7	3A	7	4M	5	5A	5	6M
21	1744	3	6A	2	7M	2	8A	1	9M	30	10M	28	11A	28	0A	26	12A	25	1A	25	2M	23	3A	23	3M
22	1745	21	4A	20	5M	21	5A	20	6M	19	6A	18	7M	17	8A	16	8M	14	9A	14	10M	12	11A	12	0A
23	1746	10	12A	9	1A	11	2M	9	3A	9	3M	7	4A	7	5M	5	6A	4	6M	3	7A	2	8M	1	9A
24	1747	29	10A	28	11M	29	11A	28	0A	27	12A	26	1A	26	2M	24	3A	23	3M	22	4A	21	5M	20	6A
25	1748	19	6M	17	7A	18	8M	16	9A	16	9M	14	10A	14	11M	12	12A	11	0A	11	1M	9	2A	9	3M
26	1749	7	3A	6	4M	7	5A	6	6M	5	6A	4	7M	3	8A	2	9M	30	10M	29	11A	28	0A	27	12A
27	1750	26	1A	25	2M	26	3A	25	4M	24	4A	23	5M	22	6A	21	7M	19	7A	19	8M	17	9A	17	10M
28	1751	15	10A	14	11M	15	11A	14	0A	13	12A	12	1A	12	2M	10	3A	9	3M	8	4A	7	5M	6	6A
29	1752	5	6M	3	7A	4	8M	2	9A	31	10A	30	11M	29	12A	28	0A	27	1M	26	2A	25	3M	24	3A
30	1753	23	4M	21	5A	23	6M	21	7A	21	7M	19	8A	19	9M	17	10A	16	10M	15	11A	14	0A	14	1M
31	1754	12	1A	11	2M	12	3A	11	4M	10	4A	9	5M	8	6A	7	7M	5	7A	5	8M	3	9A	3	10M
32	1755	1	10A			1	11A	29	12A	29	1A	28	2M	27	3A	25	3M	24	4A	24	5M	22	6A	22	6M
33	1756	31	11M			31	0A	18	9M	17	10A	16	11M	15	12A	14	1A	13	1M	12	2A	11	3M	10	4A
34	1757	9	4M	7	5A	9	6M	7	7A	7	7M	5	8A	5	9M	3	10A	2	10M	1	11A	31	0A	30	1M
35	1758	28	2M	26	3A	28	3M	26	4A	26	4M	24	5A	24	6M	22	7A	21	7M	20	8A	19	9M	18	10A
36	1759	17	10M	15	11A	17	0A	16	1M	15	1A	14	2M	13	3A	12	2M	10	4A	10	5M	8	6A	8	7M
37	1760	6	7A	5	8M	5	9A	4	10M	3	10A	2	11M	1	12A	31	1A	30	1M	28	2A	28	3M	26	4A
38	1761	24	5A	23	6M	24	7A	23	8M	22	9A	21	10M	20	10A	19	11M	17	11A	17	0A	16	1M	15	2A
39	1762	14	2M	12	3A	14		12	4A	12	4M	10	5A	10	6M	8	7A	7	7M	6	8A	5	9M	4	10A

C Y C L E.

TABLE of the Mean New Moons concluded.

Years of the Cycle.	TABLE of the Mean New Moons concluded.																								
	A.D.	January.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		October.		Novemb.		Decemb.	
		D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.	D.	H.
40	1763	3	11M	1	12A	3	0A	2	1M	¹ 1A ₃₁ 2M	29	3A	29	4M	27	4A	26	5M	25	6A	24	7M	23	7A	
41	1764	22	8M	30	9A	21	10M	19	11A	19	11M	17	12A	17	1A	16	2M	14	2A	14	3M	12	4A	12	5M
42	1765	10	5A	9	6M	10	6A	9	7M	8	7A	7	8M	6	9A	5	10M	3	10A	3	11M	1	12A	1	1A
43	1766	29	2A	28	3M	29	4A	28	5M	27	5A	26	6M	25	7A	24	8M	22	8A	22	9M	20	10A	20	11M
44	1767	18	11A	17	0A	19	1M	17	2A	17	2M	15	3A	15	4M	13	5A	12	6M	11	6A	10	7M	9	8A
45	1768	8	8M	6	9A	7	10M	5	11A	5	11M	3	12A	3	1A	² 2M ₃₁ 2A	30	3M	29	4A	28	5M	27	5A	
46	1769	26	6M	24	7A	26	7M	24	8A	24	8M	22	9A	22	10M	20	11A	19	11M	18	12A	17	1A	17	2M
47	1770	15	2A	14	3M	15	4A	14	5M	13	5A	12	4M	11	7A	10	8M	8	8A	8	9M	6	10A	6	11M
48	1771	4	11M	3	0A	5	1M	3	2A	3	2M	1	3A	¹ 4M ₃₀ 5A	29	5M	27	6A	27	7M	25	8A	25	9M	
49	1772	23	9A	22	10M	22	10A	21	11M	20	11A	19	0A	19	1M	17	2A	16	2M	15	3A	14	4M	13	5A
50	1773	12	5M	10	6A	12	7M	10	8A	10	8M	8	9A	8	9M	6	10A	5	11M	4	12A	3	1A	3	2M
51	1774	¹ 2A ₃₁ 3M		¹ 4A ₃₁ 5M		29	5A	29	6M	27	7A	27	8M	25	8A	24	9M	23	10A	22	11M	21	11A	21	11A
52	1775	20	0A	19	1M	20	2A	19	3M	18	3A	17	4M	16	5A	15	6M	13	6A	13	7M	11	8A	11	9M
53	1776	9	9A	8	10M	8	10A	7	11M	6	12A	5	0A	5	1M	3	2A	2	2M	¹ 3A ₃₁ 4M	29	5A	29	5M	
54	1777	27	6A	26	7M	27	8A	26	9M	25	9A	24	10M	23	11A	22	0A	20	12A	20	1A	19	2M	18	3A
55	1778	17	3M	15	4A	17	5M	15	6A	15	6M	13	7A	13	8M	11	9A	10	9M	9	10A	8	11M	7	12A
56	1779	6	0A	5	1M	6	2A	5	3M	4	3A	3	4M	2	5A	¹ 6M ₃₀ 6A	29	7M	28	8A	27	9M	26	9A	
57	1780	25	10M	23	11A	24	11M	22	12A	22	0A	21	1M	20	2A	19	3M	17	3A	17	4M	15	5A	15	6M
58	1781	13	6A	12	7M	13	8A	12	9M	11	9A	10	10M	9	11A	8	0A	6	12A	6	1A	5	2M	4	3A
59	1782	3	3M	1	4A	3	5M	1	6A	¹ 6M ₃₀ 7A	29	8M	28	9A	27	9M	25	10A	25	11M	23	12A	23	0A	
60	1783	22	1M	20	2A	22	2M	20	3A	20	3M	18	4A	18	5M	16	6A	15	6M	14	7A	13	8M	12	9A
61	1784	11	9M	9	10A	10	11M	8	12A	8	0A	7	1M	6	2A	5	3M	3	3A	3	4M	1	5A	¹ 6M ₃₀ 6A	
62	1785	29	7M	27	8A	29	9M	27	10A	27	10M	25	11A	25	0A	24	1M	22	1A	22	2M	20	3A	20	3M
63	1786	18	4A	17	5M	18	5A	17	6M	16	6A	15	7M	14	8A	13	9M	11	9A	11	10M	9	11A	9	0A
64	1787	7	12A	6	1A	8	2M	6	3A	6	3M	4	4A	4	5M	2	6A	¹ 6M ₃₀ 7A	30	8M	28	9A	28	9M	
65	1788	26	10A	25	11M	25	12A	24	1A	24	1M	22	2A	22	3M	20	4A	19	4M	18	5A	17	6M	16	7A
66	1789	15	7M	13	8A	15	9M	13	10A	13	10M	11	11A	11	0A	10	1M	8	1A	8	2M	6	3A	6	4M
67	1790	4	4A	3	5M	4	5A	3	6M	2	6A	¹ 7M ₃₀ 8A	30	9M	28	9A	27	10M	26	11A	25	0A	24	12A	
68	1791	23	1A	22	2M	23	3A	22	4M	21	4A	20	5M	19	6A	18	7M	16	7A	16	8M	14	9A	14	10M
69	1792	12	10A	11	11M	11	12A	10	1A	10	1M	8	2A	8	3M	6	4A	5	4A	4	5A	3	6M	2	7A
70	1793	¹ 7M ₃₀ 8A		¹ 9M ₃₀ 10A		29	10M	28	11A	27	0A	27	1M	25	1A	24	2M	23	3A	22	4M	21	4A	21	4A
71	1794	20	5M	18	6A	20	6M	18	7A	18	7M	16	8A	16	9M	14	10A	13	10M	12	11A	11	0A	11	1M
72	1795	9	1A	8	2M	9	3A	8	4M	7	4A	6	5M	5	6A	4	7M	2	7A	² 8M ₃₁ 9A	30	10M	29	10A	
73	1796	28	11M	26	12A	27	0A	26	1M	25	1A	24	2M	23	3A	22	4M	20	4A	20	5M	18	6A	18	7M
74	1797	16	7A	15	8M	16	9A	15	10M	14	10A	13	11M	12	12A	11	1A	10	1M	9	2A	8	3M	7	4A
75	1798	6	4M	4	5A	6	6M	4	7A	4	7M	2	8A	² 9M ₃₁ 10A	30	10M	28	11A	28	0A	27	1M	26	1A	
76	1799	25	2M	23	3A	25	4M	23	5A	23	5M	21	6A	21	6M	19	8A	18	8M	17	9A	16	10M	15	11A
1	1800	14	11M	12	12A	13	0A	12	1M	11	1A	10	2M	9	3A	8	4M	6	4A	6	5M	4	6A	4	7M

The year 1800 begins a new Cycle.

C Y C L E.

This table may be made perpetual, by deducting six hours from the time of new moon in any given year and month from 1724 to 1800, in order to have the time of new moon in any year and month 76 years afterward; or, deducting 12 hours for 152 years, 18 hours for 228 years, and 24 hours for 304 years; because, in that time the changes of the moon anticipate almost a complete natural day. And if the like number of hours be added for so many years past, we shall have the mean time of any new moon already elapsed. This table may be easily adapted to the new style, for any time to come. Thus, because the year 1724 in this table is the first year of the cycle for which it is made; if, from any year of Christ after 1800, you subtract 1723, and divide the excess by 76, the quotient will shew how many entire cycles of 76 years are elapsed since the beginning of the cycle here provided for; and the remainder will shew the year of the current cycle answering to the given year of Christ. Hence, if the remainder be 0, you must instead of it put 76, and lessen the quotient by unity. Then, look in the left-hand column of the table for the number in your remainder, and against it you will find the times of all the mean new moons in that year of the present cycle. And whereas, in 76 Julian years, the moon anticipates 5 hours 52 minutes, if these hours and minutes be multiplied by the quotient above found; the product subtracted from the times in the table will leave the corrected times of the new moons to the old style; which may be reduced to the new style, thus:—

Divide the number of entire hundreds in the given year of Christ by 4, multiply this quotient by 3, to the product add the remainder, and from their sum subtract two:—this last remainder denotes the number of days to be added to the times above corrected, in order to reduce them to the

new style. The reason is this; because every 400 years of the new style gains 3 days upon the old style, one of which it gains in each of the centenary years succeeding that which is exactly divisible by 4 without a remainder: but then, when you have found the days so gained, 2 must be subtracted from this number, on account of the rectifications made in the calendar by the council of Nice, and since by pope Gregory. It must also be observed, that the additional days found, as above directed, do not take place in the centenary years, which are not multiples of 4 till February 29th, Old Style, for on that begins the difference between the styles; till which day, therefore, those that were added in the preceding years must be used. *E. G. Required the mean time of new moon in April, A. D. 1808, N. S.*

From 1808 take 1723, and the remainder 85, divided by 76, gives a quotient 1 and remainder 9; against which, in the table, is April 13^o 8^h A: and subtracting from it 5^h 52' × 1, the above quotient, the remainder will be 13^d 2^h 8', the mean time, according to the old style; then the quotient of the entire hundreds in 1808 divided by 4 being 4, and the remainder 2, multiply 4 by 3; add the product 12 to the remainder 2, the sum will be 14, from which subtract 2, and the remainder 12, added to the above time, old style, viz. 13^d 2^h 8' gives 25^d 2^h 8' A. Hence, it appears, that the mean time of new moon in April, 1808 New Style, is the 25th day at 8 minutes past 2 in the afternoon.

If 11 days be added to the time of any new moon in this table, it will give the time, according to the new style, till the year 1800. And if 14 days, 18 hours, 22 minutes, be added to the mean time of new moon, in either style, it will give the mean time of next full moon according to that style.

TABLE I. Shewing the Golden Number (which is the same both in the Old and New Style) from the Christian Æra to A. D. 4000.

		Years less than an hundred.																			
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Hundreds of Years.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56		
	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75		
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94		
	95	96	97	98	99																
c	1900	3800	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
100	2000	3900	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5
200	2100	4000	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10
300	2200	&c.	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
400	2300	—	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1
500	2400	—	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6
600	2500	—	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11
700	2600	—	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
800	2700	—	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2
900	2800	—	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7
1000	2900	—	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12
1100	3000	—	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1200	3100	—	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3
1300	3200	—	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8
1400	3300	—	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13
1500	3400	—	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1600	3500	—	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	3	4
1700	3600	—	10	11	12	13	14	15	16	17	18	19	1	2	3	4	5	6	7	8	9
1800	3700	—	15	16	17	18	19	1	2	3	4	5	6	7	8	9	10	11	12	13	14

C Y C L E.

TABLE II. Shewing the number of Direction, for finding Easter Sunday by the Golden Number and Dominical Letter.

G. N.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
A	16	19	5	26	12	33	19	12	26	19	5	26	12	5	26	11	33	19	12
B	27	15	6	27	13	34	20	13	27	20	6	27	13	6	20	13	34	20	6
C	28	14	7	21	14	35	21	7	28	21	7	28	14	7	21	14	28	21	7
D	29	15	8	22	15	29	22	8	29	15	8	29	15	1	22	15	29	22	8
E	30	16	2	23	16	30	23	9	30	16	9	23	16	2	23	9	30	23	9
F	24	17	3	24	10	31	24	10	31	17	10	24	17	3	24	10	31	24	10
G	25	18	4	25	11	32	25	11	32	18	4	25	18	4	25	11	32	25	11

This Table is adapted to the New Style.

Use of Table I. Find the even hundreds of any given year at the left hand, and take the odd years in the columns at the head of the table; and where the horizontal and vertical column meet, you will have the golden number (which is the same both in old and new style) for the given year. *E. G.* Let the year be 1808; and having found 1800 at the left hand of the table, look for 8 at the top; under this number, and even with 1800, we find 4, which is the golden number for that year. See **GOLDEN NUMBER**, and preceding part of this article.

To find the *Epact*; see **ΕΡΑΚΤ**, and the preceding part of this article.

CYCLE of the Moon, or Lunar CYCLE, a period of 19 solar years; equivalent to 19 lunar years, and 7 intercalary months, which was thought to contain exactly 6940 days, or 235 synodical months; in which time the new and full moons and her other aspects, are supposed to return to the same day of the Julian year.

This is also called the *Mutonic period*. (See the preceding article.)

CYCLE of the Sun, or Solar CYCLE, is a period of 28 years, after which the days of the month return to the same days of the week.

In order to connect the days of the week with the days of the year, the first seven letters of the alphabet are chosen to mark the several days of the week: and they are disposed in such a manner for every year, that the letter A shall stand for the 1st day of January; the letter B for the second day; the letter C for the third; and so on; the seven letters being constantly repeated in their order through all the days of the year. It is plain, from this disposition, that the same letter will answer to Sunday, or any other day of the week, throughout the whole year. The letter which stands for Sunday, in any year, is called the dominical letter for that year.

This cycle has no reference to the motion of the sun, as its name would seem to import. It has derived its appellation from the Latin name of Sunday, *Dies Solis*; the chief use of this cycle being to find the dominical letters, or the days of the year that answer to Sunday.

A common year of 365 days contains 52 weeks and 1 day: hence it follows, that the first and last days of a common year fall on the same day of the week, and answer to the same letter. Because the first day of every year is represented by the letter A, it is plain that if the first day of a common year be Monday, the seventh day will be Sunday, and the dominical letter for that year will be G: the following year will begin with Tuesday, and the sixth day of the year will be Sunday, to which the letter F corresponds:

if this second year be a common one, the third year will begin with Wednesday, and the fifth day of the year will be Sunday, and the dominical letter will now be E. Thus, if all the years were common ones, the several letters, taken in a retrograde order, would successively stand for Sunday, and the cycle of the dominical letters would be completed in seven years, after which the letters would return again in the same order. But this simple arrangement is disturbed by the bissextile, or leap years, each of which contains 52 weeks and two days. In order to correct the effect of the intercalation, and to cause the same letters to fall on the same days of the month, after the 29th of February, that they would have done if no intercalation had taken place, the whole series of letters must be shifted forward a day after the 29th of February: and thus every leap year has two dominical letters; the one to be used before the intercalary day, and the other, which always stands before the first in the order of the letters, to be used for the rest of the year. It now appears that there are five different dominical letters, all standing next one another in a retrograde order, required for every period of four years: and as it is easy to prove that no more than seven such combinations of five letters can possibly be formed, it follows that, in 28 years, all these combinations will be exhausted, the dominical letters will be again renewed in the same order as before, and the days of the month will return to the same days of the week.

If the contrivers of this cycle had consulted simplicity and convenience, they would have made the series of cycles to commence with the Christian era. This consideration has been neglected, and the first year of our era is found to correspond to the 10th of the solar cycle. Hence is derived this rule for finding the rank of any proposed year in the current cycle of 28 years. "Add 9 to the proposed year, divide the sum by 28, and the remainder of the division is the year of the solar cycle; if there be no remainder, the proposed year is the 28th year of the cycle." It will readily be observed that the first year of every cycle is a leap year, unless in the case of a centurial year, when the intercalary day is omitted.

The following table shews the disposition of the letters in the solar cycle for 100 years, beginning with 1800.

1	E	D	5	G	F	9	B	A	13	D	C	17	F	E	21	A	G	25	C	B		
2		C	6		E	10		G	14		B	18		D	22		F	26		A		
3			B	7		D	11		F	15		A	19		C	23		E	27		G	
4				A	8		C	12		E	16		G	20		B	24		D	28		F

C Y C L E.

The year of the cycle for 1808, found by the preceding rule, is 25; to which the dominical letters C B correspond. Hence, this year, which is a leap year, began on Friday, and will end on Saturday.

There is a peculiarity in the use of this table for the year 1800, which it may be proper to remark: the year of the cycle for 1800 is 17, to which the letters F and E correspond; but 1800 being a common year, the letter E is the dominical letter throughout the whole year.

In the year 1900, the order of the letters will be inter-

rupted by the omission of the intercalary day, and a new table must be constructed. For this purpose, it is only necessary to move the letters in the preceding table one place forward; so that the letters for the four first years of the cycle will be F E, D, C, B: and, because the year 2000 is a bissextile year, the order of the letters will not be again interrupted till 2100, and so long will the new table continue in force.

The dominical letter may be easily found for any year either before or after the Christian era, by the following tables:

TABLE III. Shewing the Dominical Letters, Old Style, for 4200 Years before the Christian Æra.

Bet. Christ.	Hundreds of Years.									
	0	100	200	300	400	500	600			
Years less than an Hundred.	700	800	900	1000	1100	1200	1300			
	1400	1500	1600	1700	1800	1900	2000			
	2100	2200	2300	2400	2500	2600	2700			
	2800	2900	3000	3100	3200	3300	3400			
	3500	3600	3700	3800	3900	4000	4100			
0	28	56	84	D C C B B A A G G F F E E D						
1	29	57	85	E D C B A G F						
2	30	58	86	F E D C B A G						
3	31	59	87	G F E D C B A						
4	32	60	88	B A A G G F F E E D D C C B						
5	33	61	89	C B A G F E D						
6	34	62	90	D C B A G F E						
7	35	63	91	E D C B A G F						
8	36	64	92	G F F E E D D C C B B A A G						
9	37	65	93	A G F E D C B						
10	38	66	94	B A G F E D C						
11	39	67	95	C B A G F E D						
12	40	68	96	E D D C C B B A A G G F F E						
13	41	69	97	F E D C B A G						
14	42	70	98	G F E D C B A						
15	43	71	99	A G F E D C B						
16	44	72		C B B A A G G F F E E D D C						
17	45	73		D C B A G F E						
18	46	74		E D C B A G F						
19	47	75		F E D C B A G						
20	48	76		A G G F F E E D D C C B B A						
21	49	77		B A G F E D C						
22	50	78		C B A G F E D						
23	51	79		D C B A G F E						
24	52	80		F E E D D C C B B A A G G F						
25	53	81		G F E D C B A						
26	54	82		A G F E D C B						
27	55	83		B A G F E D C						

TABLE IV. Shewing the Dominical Letters, Old Style, for 4200 Years after the Christian Æra.

After Christ.	Hundreds of Years.									
	0	100	200	300	400	500	600			
Years less than an Hundred.	700	800	900	1000	1100	1200	1300			
	1400	1500	1600	1700	1800	1900	2000			
	2100	2200	2300	2400	2500	2600	2700			
	2800	2900	3000	3100	3200	3300	3400			
	3500	3600	3700	3800	3900	4000	4100			
0	28	56	84	D C E D F E G F A G B A C B						
1	29	57	85	B C D E F G A						
2	30	58	86	A B C D E F G						
3	31	59	87	G A B C D E F						
4	32	60	88	F E G F A G B A C B D C E D						
5	33	61	89	D E F G A B C						
6	34	62	90	C D E F G A B						
7	35	63	91	B C D E F G A						
8	36	64	92	A G B A C B C D E D F E G F						
9	37	65	93	F G A B C D E						
10	38	66	94	E F G A B C D						
11	39	67	95	D E F G A B C						
12	40	68	96	C B D C E D F E G F A G B A						
13	41	69	97	A B C D E F G						
14	42	70	98	G A B C D E F						
15	43	71	99	F G A B C D E						
16	44	72		E D F F G F A G B A C B D C						
17	45	73		C D E F G A B						
18	46	74		B C D E F G A						
19	47	75		A B C D E F G						
20	48	76		G F A G B A C B D C E D F E						
21	49	77		E F G A B C D						
22	50	78		D E F G A B C						
23	51	79		C D E F G A B						
24	52	80		B A C B D C E D F E G F A G						
25	53	81		G A B C D E F						
26	54	82		F G A B C D E						
27	55	83		E F G A B C D						

CYCLE.

TABLE V. The Dominical Letter, New Style, for 4000 Years after the Christian Æra.

After Christ.			Hundreds of Years.					
Years less than an Hundred.					C	E	G	B A
		100	200	300	400			
	500	600	700	800				
	900	1000	1100	1200				
	1300	1400	1500	1600				
	1700	1800	1900	2000				
	2100	2200	2300	2400				
	2500	2600	2700	2800				
	2900	3000	3100	3200				
	3300	3400	3500	3600				
	3700	3800	3900	4000				
					C	E	G	B A
129	57	85	B	D	F	G		
230	58	86	A	C	E	F		
331	59	87	G	B	D	E		
432	60	88	F E	A G	C B	D C		
533	61	89	D	F	A	B		
634	62	90	C	E	G	A		
735	63	91	B	D	F	G		
836	64	92	A G	C B	E D	F E		
937	65	93	F	A	C	D		
1038	66	94	E	G	B	C		
1139	67	95	D	F	A	B		
1240	68	96	C B	E D	G F	A G		
1341	69	97	A	C	E	F		
1442	70	98	G	B	D	E		
1543	71	99	F	A	C	D		
1644	72		E D	G F	B A	C B		
1745	73		C	E	G	A		
1846	74		B	D	F	G		
1947	75		A	C	E	F		
2048	76		G F	B A	D C	E D		
2149	77		E	G	B	C		
2250	78		D	F	A	B		
2351	79		C	E	G	A		
2452	80		B A	D C	F E	G F		
2553	81		G	B	D	E		
2654	82		F	A	C	D		
2755	83		E	G	B	C		
2856	84		D C	F E	A G	B A		

Use of the Tables. In Table III. or IV. for Old Style or Table V. for New Style, look for the hundreds of years at the head of the table, and for the odd years, necessary for completing the given year, at the left hand; and where the columns meet, you have the dominical letter desired. Suppose it were required to find the dominical letter for the year of our Lord, 1808, New Style, look for 1800 at the head of Table V. and for 8 at the left hand of the same table; and in the angle formed by the lines of the two columns, we find CB, which are the dominical letters for that year, and shew that it is leap-year; because leap-year

has always two dominical letters, the change taking place at the end of February. If the dominical letters were wanted for the same year, old style, they will be found by Table IV. to be E D. But to find the dominical letter for any year before Christ, subtract 1 from that year, and proceed to find it, as before, by Table III. E. G. Let it be required to find the dominical letter for the 585th year before the first year of Christ, look for 500 at the head of Table III. and for 84 at the left hand; and in the meeting of the columns you find F E the dominical letter, indicating that year to have been leap-year.

The following table serves for finding the day of the month answering to any day of the week; or the day of the week answering to any day of the month, for any year past or to come.

TABLE VI. Shewing the Days of the Months for both Styles by the Dominical Letters.

Week Day.	A	B	C	D	E	F	G
	1	2	3	4	5	6	7
January 31	8	9	10	11	12	13	14
October 31	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
Feb. 28-29	5	6	7	8	9	10	11
March 31	12	13	14	15	16	17	18
November 30	19	20	21	22	23	24	25
	26	27	28	29	30	31	
April 30	2	3	4	5	6	7	8
July 31	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31					
August 31	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
September 30	3	4	5	6	7	8	9
December 31	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31						
May 31	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31			
June 30	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	

Use of the Table. Having found the dominical letter for the given year, enter Table VI. with the dominical letter at the head; and under it, all the days in that column are Sundays, in the divisions of the months; those in the next column to the right hand are Mondays; those of the next are Tuesdays, and so on to the last column under G; from which go back to the column under A, and proceed as before. Thus, in the year 1808, the dominical letters in

new style are CB; then all the days under C are Sundays, those under D are Mondays, &c. to that year as far as Feb. 28; and those under B are Sundays for the rest of the year, and those under C are Mondays, &c. If it be required to find the day of the week answering to any day of the month, it may be easily had from the same table by the letter that stands at the top of the column in which the given day of the month is found. Thus, the letter that stands over the 28th of May is A, and in the year 585, B. C. the dominical letters were found to be FE, which, being a leap-year, and E taking place from the 24th of February to the end of that year, (see *BISSEXTILE*), shews by the table that the 25th of May was Sunday; and, therefore, the 28th must have been Wednesday. Hence, as it is said that the famous eclipse of the sun, foretold by Thales, by which a peace was brought about between the Medes and Lydians, happened on the 28th of May, in the 585th year B. C., it fell on a Wednesday. See *DOMINICAL LETTER*.

CYCLE of Indiction, or The Indiction, is a period of 15 years, continually renewed like the other cycles.

This cycle is merely chronological, and has no reference to astronomy. It was introduced at Rome under the emperors, and it began in the year 312 of our era. Authors are very much divided in regard to the purpose which this cycle was intended to serve, and even in regard to the time it was first introduced. The times for the payment of certain taxes, or tributes, seem to have been regulated by it.

We may suppose the series of indictions to have commenced three years before our era, and then the rank of any proposed year in the current circle will be found by this rule: "add 3 to the given year, and divide by 15; the remainder of the division is the year of the indiction: if there be no remainder, 15 is the year of the indiction."

Thus, if the year 1808 be proposed, it will be found that the year of the indiction is 11.

The Julian period is a space of 7980 years, obtained by multiplying together the numbers 28, 19, and 15, which are the years in the lunar and solar cycles, and the indiction. This period was first proposed by Joseph Scaliger in 1583, with the view of introducing into chronology a language at once uniform and free from uncertainty. The principle by which these advantages are obtained is simple and not difficult to prove; namely, that there is only one number, less than 7980, which, being separately divided by 28, 19, and 15, will leave three proposed remainders. Hence, it follows, that when the ranks of any proposed year in the three cycles are known, the place of that year, in the Julian period, will be thence determined. Thus, every year in this long period is marked by peculiar characters, that distinguish it from all other years. The chronology of events, prior to the Christian era, is often not a little perplexed; both because authors make use of the Julian years now employed, and because the epochs from which they reckon are, in many instances, arbitrary and hypothetical. On this account, there is much advantage derived from reducing the principal epochs made use of in ancient history to the correspondent years of the Julian period, by which means their relative places are clearly fixed, without danger of ambiguity.

The Julian period has given occasion to the proposing of an arithmetical question, for the purpose of finding the rank which any given year holds in it. To do this, it is necessary to determine a number, which, when separately divided by 28, 19, and 15, shall leave three given remainders: a problem which, in general, is indeterminate, but admits of only one answer, when the restrictions arising from the nature of the case are taken into view. This problem has been often resolved, and is attended with no difficulty: on

this account, we shall be content with inserting a rule, without stopping to give the invelligation of it. Let l denote the rank of the proposed year in the lunar cycle, S its rank in the solar cycle, and i its rank in that of the indictions; then, having found the value of the expression $4200 \times l + 4845 \times S + 6916 \times i$, let it be divided by 7980, and the remainder of the division will be the year of the Julian period required.

For the first year of our era, $l = 2$, $S = 10$, and $i = 4$; and hence that year is found to correspond to the 4714th of the Julian period.

This period commenced 710 years before the supposed year of the creation, or, as Usher states it, 4004 years B. C. At no later period than this could all the cycles begin together, and it is not yet completed; and therefore it includes all other cycles, periods, and eras. At the close of the 4713th year of this period was the Dionysian or vulgar era of Christ's birth; and consequently the first year of his age, according to that account, coincided with the 4714th year of the said period. Therefore, if to the current year of Christ we add 4713, the sum will be the year of the Julian period. And to find the year of the Julian period, corresponding to any given year before the first year of Christ, subtract the number of that given year from 4714, and the remainder will be the year of the Julian period.

CYCLE of Easter, Great Paschal Cycle, called also the *Victorian or Dionysian Period*, is the product of the solar and lunar cycles, or of 28 and 19, comprehending 532 years. If the new moons did not anticipate upon this cycle, Easter-day would be always the Sunday next after the full moon which follows the 21st of March. But on account of this anticipation, which was not duly regarded before the alteration of the style, the ecclesiastical Easter has been several times, within the last century, a week different from the *true Easter*: an inconvenience which is now remedied by making the table which was used for finding Easter for ever, in the Common Prayer Book, of no longer use than the lunar difference from the new style will allow. The earliest Easter possible is the 22d of March, and the latest the 25th of April. Within these limits are 35 days, and the number belonging to each of them is called the *NUMBER of Direction*; because it serves to find the time of Easter for any given year. In order to find this number of direction, according to the new style, first find the dominical letter, and then the golden number for the given year; then enter TABLE II. with the dominical letter at the left hand, and the golden number at the top; and where the horizontal and vertical columns meet is the number of direction for that year: which number, added to the 21st day of March, shews on what day either of March or April Easter Sunday falls in that year. *E. G.* The dominical letters for the year 1808 are CB, and the golden number is 4, and the number of direction, corresponding to these, is 27; which, reckoned from the 21st of March, gives the 17th of April for Easter Sunday.

CYCLES, in *Harmonics*, are certain determinate periods or series of pulses or vibrations, excited in the air by the consonance of two musical sounds.

Dr. Smith (*Harmonics*, p. 56.) distinguishes these, 1st, into *simple cycles*, when the least terms of the ratio expressing a small interval differ but by 1; 2d, *complex cycles*, when the least terms of such a consonance differ by more than unity; 3d, *short cycles*, formed by the pulses of perfect consonances, or such whose ratios are expressed in small numbers; and, 4th, *long cycles*, of the pulses of imperfect unisons, or other consonances, which are not expressible but by high or surd numbers.

In his seventh proposition, Dr. Smith demonstrates, "that in going from either end to the middle of any simple cycle, or period of the pulses of imperfect unisons, the alternate lesser intervals between the successive pulses increase uniformly, and are proportional to their distances from that end; and at any distances from it less than half the simple cycle or period, are less than half the lesser of the two vibrations of the imperfect unisons:" from whence he deduces as corollaries, 1. "That any simple cycle or period of the pulses of imperfect unisons contains one more of the quicker than of the slower vibrations." 2. "The lesser intervals that lie nearest to the periodical points, and the points of coincidence, are less than any of the rest." 3. "Some of the alternate lesser intervals of the pulses of imperfect unisons are the differences of equal numbers of their vibrations, counted from the nearest coincident pulses; and others are the differences of equal numbers of the same part or parts of their single vibrations, counted from the nearest periodical point." 4. "If the vibrations of two couples of imperfect unisons, or of any two consonances, be proportional, the periods and cycles of their pulses, whether simple or complex, will be in the ratio of the homologous vibrations." 5. "The length of the period of the least imperfections, in any consonance of imperfect unisons, is the same as that of the period of its pulses." At page 69, the following is deduced as one of the corollaries to his eighth proposition; viz. "The imperfect short cycle of any imperfect consonance contains equal numbers of the slower and quicker vibrations of the imperfect unisons, from whence it is derived."

If R and r be the least integers in the ratio of the interval between any two sounds, and V and v represent the times of their single vibrations, respectively; then will the length of the cycle of times between the successive coincidences of the pulses of V and v be rV or Rv ; because these multiples of V and v are the least of any which can be equal; R and r being prime to each other.

Also, if S and s be the least integers of another consonance, whose vibrations are V and v ; then the length of its cycle is sV or Sv .

Hence the length of the cycle of V and v , is to that of V and s , as r to s ; that is, consonances which have a common sound or vibration, V , have the lengths of their cycles proportional to the numerators of the fractions $\frac{r}{R}V = v$, $\frac{s}{S}V = v$, expressing the times of the single vibrations of the other sounds. Harm. p. 22.

Supposing the vibrations, V and v , of imperfect unisons to be incommensurable, or $V : v :: \sqrt{p} : \sqrt{q}$; and x to be an indeterminate vibration, and $V : x :: m : n$. Then if the ratios of the indeterminate numbers, m, n , be supposed to approach gradually to the given ratio of \sqrt{p} to \sqrt{q} ; though the length, nV or mx , of the indeterminate cycle of the pulses of V and x increase without limits, nevertheless the length $\frac{n}{m-n}V = \frac{m}{m-n}x$, of the indeterminate period of their pulses tends gradually to a determinate limit,

$\frac{\sqrt{q}}{\sqrt{p}-\sqrt{q}}V = \frac{\sqrt{p}}{\sqrt{p}-\sqrt{q}}v$. And this is the period of the pulses of the incommensurable vibrations, V, v , which excites the determinate sensation of this imperfect unison, be the complex cycle of their pulses ever so long, infinite, or impossible. The doctor adds, at page 102, "I say, determinate sensation; for though the alternate lesser intervals of the pulses in the several successive periods of V and v , even

when commensurate, are not precisely equal, yet it is highly probable that the ear could not distinguish a repetition of any one period from the succession of them all, and seems agreeable to experience, in observing the identity of tone of imperfect unisons held out upon an organ."

CYCLIDIUM, in *Zoology*, a genus of vermes, invisible to the naked eye, of a simple form, pellucid, flat, and orbicular or oval. They are found chiefly in vegetable infusions.

Species.

BULLA. Orbicular and transparent. Müll. *Cyclidium corpore orbiculi sub-fusco*, Hill.

Found in infusions of hay. Its colour is white and pellucid, with the margin rather dark; and its motion slow and circular.

MILIUM. Elliptical and crystalline. Müll.

Observed in vegetable infusions; its texture appears membranaceous, and is marked with a line through the whole length.

PEDICULUS. Oval and convex, beneath flat. Müll. Goetze, &c

Discovered by Trembley on the arms of the hydra fusca; the colour is white and gelatinous; with both extremities depressed and truncated, or sometimes one of them cleft.

NUCLEUS. Oval; posterior part acuminated. Müll.

Resembles a grape-seed; the intestines are visible, and the fore and hind part at each side are dark. Found in vegetable infusions.

ROSTRATUM. Oval; the anterior part ending in a point. Müll. Spallanz.

This species is pellucid and smooth, with a blue canal within branching into two arms, and two transverse blue lines just beneath the middle of the body.

RADIANS. Ovate, with distinctly visible intestines. Hermann. *Cyclidium corpore elliptico*, Hill, Spallanzani, &c.

Pellucid, with a blackish margin, and transparent vesicular intestines enclosed in a blueish pellicle.

GLAUCOMA. Oval, with the intestines hardly visible. Müll.

Found in water which had been kept in a stagnant state for the space of six months; it is pellucid, and membranaceous, with transparent greenish-blue intestines; the margin sometimes blackish.

CYCLIDIUM, a species of *TRICHODA* and also of *CERCARIA*; which see respectively.

CYCLISCUS, (from *κύκλος*, *circulus*;) an instrument in form of a half-moon; used by the surgeons to scrape the skull, in fractures of that part.

CYCLOGASTER, in *Ichthyology*, the *CYCLOPTERUS Liparis* of Gmelin; which see.

CYCLOGRAPH, in *Practical Geometry*, an instrument contrived, as its name imports, for describing the arcs of circles, and applicable to other useful purposes. This instrument (*Plate IV. Geometry, fig. 1.*) is composed of five rulers: four of them, $DE, DF, GE,$ and GF , forming a trapezium, are moveable on the joints, $D, E, F,$ and G ; the fifth ruler, DI , passes under the joint D , and through a socket carrying the opposite joint G . The distances from the centre of the joint D , to that of the joints E and F , are exactly equal, as are the distances from G to the same joints. The rulers, DE and DF , pass beyond the joints, E and F , where a roller is fixed to each; the rollers are fixed upon their axes, which move freely, but steadily on pivots, so as to admit of no shake by which the inclination of the axes can be varied. The ruler, ID , passing beyond

the joint D, carries a third roller A, like the others, whose axis lies precisely in the direction of that ruler; the axes of B and C extend to K and L.

A scale is put on the ruler DI, from H to G, shewing, by the position of the socket, G, thereon, the length of the radius of the arc in inches, that would be described by the end I, in that position of the trapezium. When the socket, G, is brought to the end of the scale near I, the axes of the two rollers B and C, the ruler DI, and the axis of the roller A, are precisely parallel; and in this position, the end I, or any other point in DI, will describe straight lines at right angles to DI; but on sliding the socket, G, towards H, an inclination is given to the axes of B and C, so as to tend to some point in the line ID, continued beyond D, whose distance from I is shewn by the scale.

A proper socket, for holding a pen or tracer, is made to put on the end I, for the purpose of describing arcs; and another is made for fixing on any part of the ruler DI, for the more convenient description of concentric arcs, where a number are wanted.

It is plain from this description, that the middle ruler, DI, in this instrument, is a true *oblique* ruler, by which lines may be drawn tending to a point, whose distance from I is shewn by the position of the socket, G, on the scale; and the instrument is made sufficiently large, so as to answer this purpose as well as the other.

In this instrument the part, intended to be used in drawing lines, lies within the trapezium, which on that account is made large; but this is not necessary. *Fig. 2.* exhibits another instrument of a similar kind, in which the trapezium may be made much smaller, and consequently less cumbersome.

DBEC represents such a trapezium, rollers, socket, and scale as above described, but much smaller. Here the ruler, ED, is continued a sufficient length beyond D, as to A, where the third roller is fixed; a pen or tracer may be fitted to the end E, or made to slide between D and A, for the purpose of drawing arcs. Adams's Geometrical and Graphical Essays, p. 151, &c.

CYCLOID. If a circle, EPF (*fig. 1.*), be made to roll along a right line, AB, in the same plane with the circle, until a fixed point, as P in the circumference, which at first touched the right line at A, comes to touch it again at B, after an entire revolution; then the curve, traced upon the plane by the point P, is called a cycloid. This genesis is familiarly illustrated by the tract made in the air by a nail in a coach-wheel; a tract which would be a perfect cycloid, could we suppose such a motion to be quite free from all the irregularities to which it is subject. The same curve is sometimes called a trochoid; and, by the French mathematicians, a roulette.

The cycloid is not a curve of great antiquity. Cardinal Cusa, about 1454, and a person whom Dr. Wallis names Carolus Bovillus, in 1500, in searching for the quadrature of the circle, both thought of rolling a circle along a right line, with the view of marking off a part equal to the periphery: but as they neither paid any particular attention to the curve traced by a fixed point in the circumference of the circle, nor gave a name to the line so described, their claim to the invention of the cycloid, although it is asserted by Dr. Wallis, seems to rest on very slender foundations. It appears from a letter written by Galileo to Torricelli, that the former of these celebrated men is more justly to be considered as the inventor of this curve, which he began to contemplate about 1559, and to which he gave the name of a cycloid, that it still bears. He informs us, that the shape of the cycloid seemed to him to be very proper for the arches

of a bridge. He likewise made some attempts to discover the proportion of the area of the curve to the area of the generating circle. In these attempts he was not successful; but the method which he employed, as related by Torricelli, if it reflect little credit on the geometrical invention of Galileo, deserves at least to be mentioned on account of its singularity. Having chosen some substance of an equable thickness and uniform texture, he cut it in the shape of a cycloid, and then, by weighing it, he tried to discover the proportion of the surface of the curve to the surface of the generating circle.

The invention of the cycloid is likewise ascribed, by the French writers, to Mersenne, who, without knowing that the same curve had already been noticed by Galileo, is said to have remarked it about 1615, when considering the motion of a wheel. It is certain that Mersenne first drew the attention of mathematicians to this curve. He proposed the problem concerning the area of the cycloid to Roberval, who appears to have discovered, about 1634, that the whole area was equal to three times the area of the generating circle. The determining of the tangents of the same curve, at that time a problem of no little difficulty, was accomplished by Des Cartes and Fermat. Mersenne, who carried on a correspondence with most of the learned men of his time, informed Galileo of the problems concerning the cycloid, which then occupied the attention of the French mathematicians: and, by this channel, the same curve came to be the subject of consideration in Italy. Torricelli resolved the problem concerning the area of the curve; and Viviani found the method of drawing tangents to it: and these discoveries were communicated to the public in an appendix to the works of Torricelli, printed in 1644. On this occasion, a keen contestation arose between Roberval and Torricelli concerning the originality of the discoveries made in Italy. The investigations of the French mathematicians were certainly prior in point of time; but, although they were handed about among the learned in France, they were not given to the public through the medium of the press: and there appears to be no good ground for the charge of plagiarism made by Roberval, which the original term of the demonstrations of Torricelli likewise helps to refute.

Pascal, under the feigned name of Dettonville, in 1658, proposed some problems concerning the cycloid to the contemporary mathematicians; and he engaged to give certain prizes to such as should resolve them against a limited time. In these problems it was required to find the dimensions of the segments of the cycloid, and of the solids generated by the rotation of these segments, and to determine the centres of gravity of the same spaces and solids: all matters of the greatest difficulty, and within the reach of mathematicians of the first rank only. On this occasion, many curious discoveries were made. Huyghens found out the exact quadrature of a definite portion of the cycloid; and Wren discovered the rectification of its arcs. But there were only two competitors, who, having considered all the problems of Dettonville, could have any pretensions to the prize. These were Dr. Wallis and La Louere, a Jesuit of Toulouse; and, on comparing the two performances given in, the superiority of that of the former was undisputed. The prize was not, however, awarded to Dr. Wallis: there were some mistakes in his calculations, and some errors in his results, which, in the opinion of the judges, justified them for withholding it. Dr. Wallis, on the other hand, contended that he had resolved all the proposed problems; and, although he admitted that there were mistakes in his original paper, some of which he had corrected by letters sent subsequent to the delivery of it, he asserted that these mistakes

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were neither very essential, nor of such a nature as to set aside his claim by the conditions of the proposer. Thus this curve, like the apple of discord, was again the occasion of dispute and dissension.

In proportion as mathematicians advanced in their researches concerning the cycloid, the more interesting and remarkable did it appear for its curious and singular properties. Leibnitz found out another definite portion of the curve admitting an exact quadrature, different from that already discovered by Huyghens; and John Bernouilli shewed how innumerable spaces, all exactly quadrable, may be determined: a discovery that included in it, as particular cases, the two portions of Huyghens and Leibnitz. A still more curious and singular property is due to Huyghens, who demonstrated that the curve produced by the evolution of a semi-cycloid is another semi-cycloid, precisely equal to the first. Nor is the cycloid less remarkable for its mechanical than for its mathematical properties. Huyghens, by his researches concerning pendulum-clocks, was led to investigate the nature of the curve, along the arcs of which, whether great or small, the times of descent, or oscillation, of a heavy body, should be perfectly equal; and he found that the curve possessed of this curious property was no other than the cycloid. In 1697, John Bernouilli proposed the following problem to all the mathematicians of Europe: Suppose a heavy body to fall through a given height, in a direction oblique to the horizon, what is the nature of the curve along which it must descend, that the time of falling may be the least possible? It is extremely natural to suppose, that the time of descent would be least along the right line, which is the shortest distance between the beginning and end of the fall: but a little reflection is sufficient to correct this first suggestion of the kind; and it has been demonstrated, that the cycloid is the curve which, in this instance, likewise answers the required conditions.

In treating of the cycloid, we shall first demonstrate, as succinctly as possible, the geometrical properties on which its mechanical properties depend; these will engage our attention in the second place; and we shall, in the last place, notice the more remarkable propositions concerning the cycloidal spaces.

1. If we suppose the fixed point in the circumference of the circle (*fig. 1.*), or the generating point of the cycloid, to have touched the base-line, first of all at A, it readily follows, from the manner in which the curve is described, that when the circle has arrived at any other position, as FPE, the right line, AE, between A and the point of contact E, is exactly equal to PE, the arc of the circle between the fixed point, P, and the same point, E: and hence, AB, the whole base, is equal to the whole periphery of the generating circle. When the circle has made exactly half a revolution, as in the position CQD, then the describing point will be at C, diametrically opposite to the point D, in which the circle touches the base line; and consequently C will be the point of the curve farthest removed from the base, AB. It is also sufficiently plain, that the same curve will be described, whether the circle be rolled from A to B, or back again from B to A: whence it appears that the part of the cycloid between A and C is similar to the part between B and C.

The line, AB, is called the base of the cycloid.

The point, C, its vertex; the line, CD, bisecting the curve, its axis; the circle, CQD, upon the axis, the generating circle.

A line, as PR, parallel to the base, and bounded by the curve and the axis, is called an ordinate; and CR, the

distance of the ordinate from the vertex, the corresponding abscissa.

2. That part of the ordinate of a cycloid, between the curve and the convexity of the generating circle, is equal to the arc of the generating circle between the ordinate and the vertex; that is, $PQ = \text{arc } CQ$. When the describing point is at P, let the revolving circle touch the base at E; draw the diameter, EF, and join PE, QD. Because the diameters EF and CD, are both perpendicular to AB, it is plain that arcs, EP, and DQ, of equal circles, have equal versed sines; consequently these arcs will be equal to one another, and their chords, which make equal angles with the diameters EF and CD, will be parallel to one another. Hence EPQD is a parallelogram, and $PQ = ED$. Again, the semi periphery CQD = the right line AD, and the arc QD = arc PE = right line AE: therefore the arc CQ = the right line ED = PQ.

The whole ordinate PR is equal to the arc CQ, together with its right line QR.

If the radius of the generating circle be supposed = r , and the length of the arc CQ = x ; then the ordinate of the cycloid $PR = r + \sin. x$, and the correspondent abscissa $CR = r - \cos. x$. Thus it appears that the relation between the abscissa and the ordinate of this curve cannot be algebraically expressed by an equation of a finite number of terms; and therefore the cycloid belongs to the class of transcendent, or mechanical curves.

3. If an ordinate of a cycloid, as PR, cut the generating circle in Q, and QC be drawn to the vertex; then a line drawn through P, (*fig. 2.*) parallel to QC, is a tangent of the curve.

Let a and b be any two points of the curve on opposite sides of P, and from these points draw two ordinates to meet the generating circle in m and n , CQ or the same line produced in H and K, and the line drawn through P in M and N: also let a line touching the circle at Q, meet the two ordinates at S and T, and CE parallel to PR in E. It is plain that CE is a tangent of the circle: therefore $CE = QE$, and consequently, $QS = SH$, and $KT = TQ$. Therefore $mH = HS - Sm = QS - Sm$, is less than the chord Qm , and much more is it less than the arc Qm . But, as has been shewn, PQ , or MH , = arc CQ; therefore $MH - Hm$, or mM , is greater than arc $QC - \text{arc } mQ$, that is, than arc mC , or the right line ma . Again, $Kn = KT + Tn = QT + Tn$, is greater than the arc Qn ; for $QT + Tn$ is greater than the sum of two tangents, $QO + On$, drawn from the extremities of the arc Qn : (20. 1. E.) therefore $KN + Kn$, or Nn , is greater than arc $CQ + \text{arc } Qn$, that is, than the arc Cn , or the right line nb . And because mM is greater than ma , and Nn likewise greater than nb , therefore the right line drawn through P parallel to CQ, will meet the cycloid only in the point P, and, every where else, will be without the curve; therefore it is a tangent.

This demonstration, which is very elegant and geometrical, is due to Wren; it is published in an Appendix to Dr. Wallis's Treatise on the Cycloid. The same conclusion might have been derived from the common method for the tangents of curve lines. Let the tangent of the cycloid at P meet the axis produced in F; then, agreeably to the

general method, $\frac{PR}{RF} = \frac{\text{fluxion of } PR}{\text{fluxion of } RF} = \frac{1 + \text{Cof. } x}{\text{Sin. } x} = \frac{\text{Sin. } x}{1 - \text{Cof. } x} = \frac{QR}{CR}$; therefore the tangent PF is parallel to CQ.

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4. Let two equal semi-cycloids, ACD and FAE , (*fig. 3.*) be placed in such a manner that their bases may be parallel, and the extremity of the base of the first may be upon the vertex of the second; then will the first be described by the evolution of the second. Let NH , a tangent of the second cycloid, meet the base of the first in H , and describe a circle equal to the generating circles of the cycloids to touch the same base in H , and produce NH to cut this circle in P : draw the ordinate NML , and the chord AM . Because NH is a tangent of the cycloid, it is parallel to the chord AM . And because AH is a common tangent of two equal circles, and the chords AM and PH are drawn from the points of contact to make equal angles with the common tangent, it is plain that these chords will divide the two equal circles into segments that are respectively equal to one another; therefore the arc AM is equal to the arc PH . But the arc AM is equal to MN , or to AH ; therefore the arc PH is equal to AH . Therefore when the revolving circle, by which the cycloidal arc AC is generated, comes to touch the base at H , the describing point will fall upon P , which is consequently a point in the curve. Draw the ordinate PQR , the chords CQ , EM , and ST , touching the cycloid at P : because the arc PH is equal to the arc AM , the chords of these arcs are equal and parallel, and hence $AL = DR$, and $CR = LE$; therefore the chord CQ is equal and parallel to the chord ME : but ST is parallel to CQ , and therefore it is also parallel to ME . Therefore because AM is perpendicular to ME , NP (parallel to AM) is perpendicular to ST (parallel to ME .) Thus all the tangents of the semi-cycloid ANF cut the semi-cycloid APC at right angles; and consequently, by what was proved of evolute and involute curves, under the head *Curvature*, the former semi-cycloid is the evolute of the latter.

5. An arc of a cycloid between the vertex and an ordinate, is double of the chord of the arc of the generating circle, between the vertex and the ordinate; that is, the arc AN is double of the chord AM . For if a thread be lapped up upon the semi-cycloid ANF , and, while the end that falls on F remains fixed, the other end, that falls on the vertex A , be moved so as to keep the thread always tight, and to unlap it from the curve; then, by what has been proved above, the moveable end of the thread will describe the semi-cycloid APC ; and, in every position of the thread, it is plain that the part of it which is detached from the curve, as NP , is equal to the arc AN , from which it has been unapp'd. Now it is manifest, from what has already been shewn, that $PH = AM = HN$; therefore the cycloidal arc AN is equal to the double of the chord AM .

Hence it appears that the whole arc of the semi-cycloid is double of the diameter of the generating circle.

This curious instance of the exact equality of the arc of a curve to a right line, is due to Wren; and it is the second instance of the kind that was discovered, the rectification of the Newtonian parabola having been the first. The demonstration here given of it is taken from Mr. Huyghens's treatise, *Horologium Oscillatorium*. Wren's own investigation is to be found in the Appendix to Dr. Wallis's treatise, *De Cycloide*.

The same conclusion may readily be obtained by the method of fluxions. For, the square of the fluxion of the arc $PC = 2x \dot{x}$; the fluxion of PR + square of the fluxion of $CR = x^2(1 + \cot^2 x)^2 + \dot{x}^2 \sin^2 x = 2x^2 \times$

$\frac{1}{2} + \cos^2 x = x^2 + \dot{x}^2 \cos^2 \frac{x}{2}$; therefore, the fluxion of

the arc $PC = 2x \dot{x} \cos \frac{x}{2}$; and, the arc $PC = 4 \sin \frac{x}{2}$;

but $2 \sin \frac{x}{2} = \text{chord } CQ$; therefore, the cycloidal arc $PC = 2 \text{ chord } CQ$.

Having now noticed the most remarkable geometrical properties of the cycloid, as far as is consistent with our plan, we are next to consider its chief mechanical properties.

6. Let a cycloid be placed with its base horizontal, and its vertex downward, as ABC (*fig. 4.*) then, if a body descend along the cycloidal arc, the increment of the velocity produced by the accelerating power of gravity in some small portion of time, as the 10th or 100th part of a second, at any part of the curve, as M , will be to the increment of the velocity, produced in the same small portion of time, at any other part of the curve, as N , as CM , the arc of the curve between the vertex and the first point M , is to CN , the arc between the vertex and the second point N . It is to be recollected that the force of gravity acts equally on all bodies in all circumstances; that it produces the same augmentation of velocity in a given time in a body descending with the greatest swiftness, as in one just beginning to obey its power. It is to be recollected too, that, when a body is made to descend along an inclined plane, part of the accelerating power of gravity is destroyed by the resistance of the plane, and the remaining part only (which is less than the whole accelerating force of gravity in the same proportion that the length of the inclined plane is greater than its height) is employed in increasing the velocity of the descending body. These things being premised, draw MR and NS tangents of the cycloid; draw also the ordinates MPF and NQG , and the chords of the generating circle CP and CQ . In a very small portion of time, as the 10th or 100th part of a second, the increment of the velocity of a body descending along the cycloidal arc at M , may be considered as equal to the increment of the velocity along the inclined plane MR , which touches the cycloid at M ; but MR is parallel to PC ; and the increment of velocity produced by the whole accelerating power of gravity, is to the increment of velocity produced in the same time on the inclined planes MR or PC , as PC is to CF , or as DC is to PC ; therefore, the increment of velocity produced by the whole accelerating power of gravity, is to the contemporaneous increment of the velocity of a body descending along the cycloid at M , as DC is to PC .

And in the very same manner is it shewn, that the increment of velocity produced by the whole accelerating power of gravity in a very small portion of time is to the contemporaneous increment of the velocity of a body descending along the cycloid at N , as DC is to CQ . Therefore it follows (*ex aequo*) that the increment of velocity in the cycloid at M is to the increment of velocity at N , as the chord PC is to the chord CQ . Now the chord PC is the half of the arc CM , and the chord CQ the half of the arc CN ; whence the proposition is manifest.

7. Supposing a cycloid to be placed as before, the time, in which a heavy body descending along the curve will reach the vertex or lowest point, is the same whatever be the length of the arc, through which the body has fallen. For the sake of presenting a more precise object to the mind we shall suppose that the arc CM is double of the arc CN , *fig. 4.*; and it is to be proved that the times of falling through these arcs are exactly of the same duration. The descending bodies being supposed to be let go from the points

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points M and N at the same instant, let them arrive at the points $m, m', m'', \&c., n, n', n'', \&c.$ at the end of any very small equal moments of time, as 10th parts or 100th parts of a second. On the supposition that has been made it will follow, from what was proved (art. 6), that the velocity generated in the cycloid at M in one moment of time will be double of the velocity generated at N in the same time: therefore the velocity with which the one body arrives at m , will be double of the velocity with which the other body arrives at n . It is no less evident that the little arc Mm described by the first body is double of the little arc Nn , described by the second body; consequently the arcs Cm and Cn , that remain to be described, have the same proportion as the whole arcs CM and CN ; therefore, in a second moment of time, the increment of velocity at m will be double of the increment of velocity at n (art. 6). And because the whole velocities, already acquired at m and n , are double one of another, and the new increments superadded likewise follow the same proportion, therefore, at the end of the second moment of time, the whole velocity acquired at m will be double of the whole velocity acquired at n , and the space mm' will be double of the space nn' . Again, because mm' is double of nn' , therefore the arcs Cm' and Cn' , that remain to be described, will still have the same proportion as the whole arcs CM and CN , and consequently the increments of velocity generated in a third moment of time, as well as the spaces run through $m'm''$ and nn'' , will be to one another in the same proportion as the arcs CM and CN ; therefore, at the expiration of the third moment, the whole velocities acquired, and the arcs Cm'' and Cn'' that remain to be described, will both have the proportion of 2 to 1. And because the same reasoning may be continued indefinitely, it follows, that at the end of any proposed time from the beginning of the falls, the whole velocities acquired, and the parts of the arcs that remain to be described, preserve invariably the same proportion as the original arcs CM and CN , that is, in the present instance, the proportion of 2 to 1; hence it is manifest, that the falls through the whole arcs are accomplished in the same time.

Although, in this demonstration, the arc CM is supposed to be double of the arc CN , yet the proposition is to be held as proved generally for all proportions of the arcs; for the reasonings do in no respect depend upon the particular proportion supposed, but are equally applicable for all proportions.

Not only are the falls through the whole arcs MC and CN performed in the same times, but the same thing is likewise true of the falls through any proportional parts of the same arcs. For the parts $Mm, m m', m' m'', \&c. Nn, nn', n' n'', \&c.$ of the two arcs that are described in the same moments of time, have been shewn to be respectively in the same proportion as the whole arcs; and therefore any aggregates of those parts will compose like parts of the whole arcs.

When a heavy body has descended through an arc of the cycloid, it will have acquired such a degree of velocity as is sufficient to make it ascend through an arc in the opposite part of the curve equal to that it fell through; it will then be reduced to a state of rest, after which it will fall back to the lowest point of the curve, and again mount up to the same height as at first. A body that thus descends and ascends is said to oscillate or vibrate; and the time employed in one descent and ascent is called the time of an oscillation or vibration. When a body oscillates in a cycloid, placed as has been supposed, all the oscillations will be performed in equal times, whether they

be wide or narrow; for the times of ascent and descent being equal, the time of an oscillation will be double of the time of descent.

Galileo first remarked that the vibrations of a pendulous body, suspended by a string, or chain, were isochronous, or of equal duration; and this discovery had been applied in astronomical observations. Two things rendered the use of such pendulums very imperfect even for the purposes of astronomy; they required the constant attention of the observer to number the vibrations, and to communicate new velocity as the motion was destroyed by the resistance of the air. Galileo had turned his thoughts to remedy these imperfections; but in this research he was not successful. Huyghens first entertained the idea of applying a pendulum to regulate the motion of a piece of mechanism, whilst at the same time the moving power of the machine should act on the pendulum in such a manner as to keep its motion from being spent; and he thus accomplished an invention of the greatest utility in common life, and no less essential to the improvement of some of the sciences, particularly astronomy. Galileo thought that all the vibrations of a pendulum swinging in a circle, whether great or small, were of equal duration; but a little experience was sufficient to correct this erroneous opinion. Huyghens, aware that the narrow vibrations in a circle were performed in shorter times than the wider ones, was led to investigate the curve in which all the oscillations, whether wide or narrow, would be perfectly isochronous; and on this occasion he discovered those curious properties of the cycloid, which he has demonstrated with all the elegance and rigour of the ancient geometry, in his *Horologium Oscillatorium*.

But it was not sufficient to have discovered the curve in which the oscillations would be of equal duration; a method was likewise wanted for making the body oscillate as required. A new research was thus presented to Huyghens, and from this sprung his beautiful theory of evolute and involute curves.

Fig. 5. If two moulds, shaped like a semicycloid, be placed so as to have their bases horizontal and to touch one another in F , from whence a pendulum is suspended by a flexible thread equal in length to the whole semicycloid, or to twice the diameter of its generating circle; it is plain, from what is proved in art. 4, that such a pendulous body will vibrate in a cycloid, and will perform all its vibrations in equal times: for the curve described by the vibrations is made up of the involutes of the semicycloids AF and FP , which taken together compose a cycloid equal to the evolutes, and so placed as to have its base horizontal, (Art. 6.). It is not a little mortifying that the finest inventions, which have cost much pains and ingenuity, are often of little practical utility. This has been the fate of Huyghens's theory in the present instance. The perfect isochronism of the cycloidal vibrations is more than counter-balanced by the unavoidable imperfections of the mechanism which they require, and they are universally rejected in practice for circular oscillations in small arcs.

8. A cycloid being supposed to be placed as before, the time in which a heavy body, that descends through any arc of the curve, will reach the lowest point, is to the time in which a heavy body will fall through the diameter of the generating circle, as half the circumference of a circle is to its diameter.

As the times of descent in all arcs (*Fig. 6.*) of the cycloid are of equal duration, we shall consider the fall through

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through the half of the curve. Suppose then, that a heavy body, which has begun to fall at B, is come to M; draw the ordinate MQP, and the chords of the generating circles DQ, QC: let Mm be a part of the curve moved through in a very small, but finite, portion of time, as the 10th or 100th part of a second; draw mrrn parallel to MP, and QO to the centre of the generating circle. Because the tangent of the cycloid at M is parallel to the chord QC, therefore $nQ = Mm$. There is no proposition respecting motion more familiar than this; that the velocity acquired by a heavy body in descending from any height is the same, whether the fall be made directly in the perpendicular, or obliquely on an inclined plane, or along any arc of continued curvature; from this it follows, that the velocity acquired by descending through the arc BM is equal to the velocity acquired by falling directly through the height DP; therefore the velocity in the curve at M is to the velocity acquired by falling through the diameter DC (which velocity we shall denote by a) in the subduplicate proportion of DP to DC, or as DQ is to DC; therefore, taking the halves of the consequents, the velocity in the curve at M is to the velocity $\frac{a}{2}$ as DQ is to DO. Because the angles DQC and OQr are right angles, therefore the angle DQO = angle nQr: Also the angle ODQ = PQC = Qnr; therefore the triangles ODQ and nQr are similar; consequently OD is to DQ as nQ or Mm is to Qr. Hence it is manifest that the velocity in the curve at M is to the velocity $\frac{a}{2}$ as Mm is to Qr: therefore a

body moving with the velocity $\frac{a}{2}$ would describe the little arc Qr in the same time that the descending body moves through the little arc Mm. The same thing may be demonstrated of all the little arcs that compose the whole semi-cycloid BMC, and the corresponding parts that make up the whole semi-circle DQC; therefore the whole time of the fall through the semi-cycloid BMC, is equal to the time in which the semi-circumference DQC would be described with the velocity $\frac{a}{2}$. But the time of falling perpendicularly through the diameter DC, is equal to the time in which the same diameter DC would be described with the velocity $\frac{a}{2}$. Hence it follows that the whole time of descent along the semi-cycloid is to the time of falling perpendicularly through the diameter DC, as the semi-circle DQC is to the diameter DC.

The whole time of a complete oscillation in any arc of a cycloid, is to the time of falling perpendicularly through the diameter of the generating circle as the circumference of a circle is to its diameter; for the time of an oscillation is double of the time of descent through the arc.

If a circle be described from F, the point of suspension of a pendulum that vibrates in a cycloid so as to touch the cycloid at its lowest point, (fig. 5.) this circle will be the oscillating circle of the curve (Art. 6.); and the time of a vibration in the cycloid will approach the nearer to an equality with the time of a vibration of the same pendulum in the circle, the less is the arc of the circle the pendulum moves through. The time of vibration in an arc of the circle, how small soever, will indeed be always greater than the time of vibration in the cycloid; but, when the circular arc is very small, the difference of the times is insensible.

Hence we learn the reason of the isochronism of vibrations in small circular arcs.

And hence too it is plain, that the time of a complete vibration in a small arc of a circle, is to the time of falling perpendicularly through half the length of the pendulum, as the circumference of a circle is to its diameter: for the time of vibration in the small circular arc, may be considered as equal in duration to the time of vibration of a pendulum of equal length in a cycloid.

By means of experiments made with pendulums, we can discover with great accuracy, the measure of the accelerating force of gravity, or the space through which a falling body will move in a given time. Thus, suppose l to be the length of a pendulum which has been found by experiment to vibrate once in a second, and let ω be $= 3.1416$ the periphery of a circle whose diameter is unit; then l will be the measure of the velocity acquired in falling through $\frac{l}{2}$ half the length of the pendulum, and $\frac{\omega l}{2}$ will be the measure of the velocity acquired in the time of one vibration of the pendulum, that is, in a second: let x be the space fallen through in the same time, then, because the spaces fallen through are proportional to the squares of the velocities acquired, $\frac{1}{2}l : x :: l^2 : \frac{\omega^2 l^2}{4}$: therefore $x = \frac{\omega^2 l}{2}$. In this manner it is found that a heavy body moves through $16\frac{1}{2}$ feet in the first second of its fall, and acquires a velocity of $32\frac{1}{2}$ feet per second.

We should next shew that the cycloid is the curve of swiftest descent: but this property cannot be clearly demonstrated, without entering upon considerations which would take up too much of our room for a matter of speculative curiosity. We proceed to finish what we have to say of this interesting curve, by noticing the most remarkable things that have been discovered concerning the mensuration of the cycloidal spaces.

9. Let MP (fig. 7.) be an ordinate of the cycloid, and draw the tangents at the extremities of the arc, MF, to meet in N, and also the chord of the generating circle FQ: then is the mixtilineal space bounded by the cycloidal arc MF, and its two tangents equal to the segment of the generating circle cut off by the chord FQ. Divide the circular arc, FQ, into an indefinitely great number of equal parts Qa, ab, &c., and draw the ordinates ac, bd, &c. as also the chords of the generating circle Fa, Fb, &c., and the lines ge, fb, &c., touching the cycloid at c, d, &c. Because the several tangents of the cycloid are respectively parallel to the chords FQ, Fa, Fb, &c., and FN, which touches the cycloid at the vertex, is parallel to MQ, ca, db, &c., therefore FN = MQ = arc FQ; Fe = ca = arc Fa; Ff = db = arc Fb, &c. Therefore, Ne = arc Qa, ef = arc ab, &c. And because what has been shewn is true, whatever be the number of the parts into which the arc FQ is divided, it will still be true when the number of parts is so great that the little arcs Qa, ab, &c. may be regarded as right lines: but when this is the case, the little triangles aFQ, aFb, &c. are plainly equal to the little triangles Nge, ebf, &c. each to each: for the bases of the triangles have been shewn to be equal; and the angles which the chords make with the periphery at Q, a, b, &c. are equal to the angles which the same chords make with the periphery, or with the tangent of the periphery, at F, that is, to the angles which the tangents MN, ge, bf, &c. make with the same tangent FN. Therefore the mixtilineal space included by the cycloidal arc and its two tangents, which is the aggregate of one of the

the sets of triangles, is equal to the circular segment, which is the aggregate of the other set of triangles.

In the case of the semi-cycloid A F, the mixtilineal space, A F T, is equal to the semicircle C Q D; and because the whole rectangle, A T F D, contained by the diameter and the semi-periphery, is equal to four times the same semicircle; therefore the semi-cycloidal space, A F D, is triple of the semicircle, and the whole area of the cycloid is triple of the area of the generating circle.

If M K be drawn perpendicular to F N, then the external space M K F, is equal to the circular space F Q P: for the triangle, M N K, is equal to the triangle F Q P.

10. If the ordinates M P and N Q, (*fig. 8.*) - cut off abscissas from the axis whose sum is equal to the radius of the generating circle, and if the chord, M N, be drawn, the cycloidal segment, M C N, will be equal to the sum of the rectilineal triangles D R Q, and D S P. Let O be the centre of the generating circle, and draw M K, N H, perpendicular to the tangent through the vertex. The trapezoid K M N H is = $KH \times \frac{MK + HN}{2} = \frac{1}{2} CO \times KH$ (hyp.) = $\frac{1}{2} CO \times MP + \frac{1}{2} CO \times QN$. Now, $\frac{1}{2} CO \times MP = \frac{1}{2} CO \times MS + \frac{1}{2} CO \times SP = \frac{1}{2} CO \times \text{arc. CS} + \frac{1}{2} CO \times SP =$ mixtilineal area S D C: and in like manner is it shewn, that $\frac{1}{2} CO \times QN =$ mixtilineal area C D R. Therefore the trapezoid K M N H = mixtilineal area S D R. But the outward spaces M K C and N H C, are equal to the circular areas C S P, and C R Q: therefore the remainders are equal; that is, the segment, M C N, is equal to the sum of the two triangles S P D, and R Q D. This property of the cycloid was discovered by John Bernouilli.

When the ordinates, M P, and N Q, coincide in one, as *mn*, the abscissas cut off will be half the radius C O: then the segment, *m C n*, will be equal to the triangle S D r, which is the equilateral triangle inscribed in the generating circle. The quadrature of this segment of the cycloid was discovered by Huyghens.

On the other hand, when one of the abscissas vanishes, and the other becomes equal to the whole radius; then the cycloidal segment, C l, will be equal to the triangle D O E, that is, to half the square of the radius. The quadrature of this segment was discovered by Leibnitz.

Protracted and Contracted Cycloid.—Supposing a circle, or wheel, to roll along a right line; let a fixed point be assumed, not in the periphery, but within it; then such a point, in one entire revolution, will trace a curve line, the base of which is equal to the whole periphery of the rolling circle, and therefore greater than the periphery of the concentric circle drawn through the fixed point: the curve line, so described, is called a protracted cycloid.

And if a point be assumed without the rolling circle, then such a point will trace a curve line, the base of which will be the same as before, and therefore less than the periphery of the concentric circle drawn through the fixed point; the curve line, so described, is called a contracted cycloid.

Let *m* denote any number, or proportion, then if a curve line be constructed by making the abscissa = $1 - \text{Cof. } x$, and the correspondent ordinate = $m \times x + \text{Sin. } x$: this curve will be a protracted cycloid when *m* is greater than 1: it will be a common cycloid when *m* = 1: and a contracted cycloid when *m* is less than 1. What is here said, is easily deduced from the definitions that have been laid down: and the nature of the curves being now defined by an equation,

their properties may be investigated by the common analytical process so well known.

It is asserted above, that the whole base of a protracted cycloid is equal to the periphery of the rolling circle; and this cannot be doubted: but, because every point of the periphery of the smaller concentric circle drawn through the fixed point, is successively applied to the same base during the description of the curve; it has been contended that the same line is also equal to the periphery of the smaller circle.

By this reasoning, it has been thought the circumference of the nave of a coach-wheel is proved to be equal to the periphery of the outer rim. How is the inconsistency to be explained? This curious mechanical problem was first proposed by Aristotle; and that philosopher himself, as well as many others, have given solutions of it which are not, in every instance, completely satisfactory.

The difficulty will be best unravelled, by separating into its elementary parts the complex motion by which the cycloids are described. It is plain that two motions are combined together in the description of these curves; one of them, an angular motion round the centre of the rolling circle, or wheel; the other, a progressive motion by which the centre is carried forward in a right line. These two motions are perfectly distinct and independent on one another; and the rolling of a circle or wheel along a right line, is to be considered as nothing more than the mechanical means of combining them in the requisite proportion. Instead of a circle rolling on a right line, conceive a wheel turning upon an axle, while the axle itself is made to move in a rectilineal course; it is manifest that the two cases differ in no respect, and are to be considered as equivalent. The two motions being now conceived in a detached and separate manner, the rectilineal space through which the centre is carried, may be supposed to bear any required proportion to the circular arc, that the fixed point moves over in the same time: now if the rectilineal space be exactly equal to the circular arc, we have the case of the common cycloid; if the rectilineal space be greater than the arc, we have the case of the protracted cycloid, where the line moved through by the progressive motion of the centre, by the very supposition made, is greater than the arc described in the same time; and if the rectilineal space be less than the arc, we have the case of the contracted cycloid, where the line moved through by the progressive motion is less than the arc described in the same time.

If a circle be made to roll upon the circumference of another circle, instead of a right line, a new set of curves, called epicycloids, will be generated by a fixed point in the plane of the rolling circle. These curves, which are useful in determining the figure of the teeth of wheel-work, will engage our attention under another head.

CYCLOIDAL SPACE, the space contained between the cycloid and its subtense.

CYCLEMETRY, from κυκλος, *circle*, and μετρο, *I measure*, the art of measuring cycles, or circles.

CYCLOPÆDIA, from κυκλος and παιδεια, *instruction*, the circle, or compass of arts and sciences; more ordinarily called *encyclopædia*.

The word cyclopædia is not of classical authority, though frequent enough among modern writers, to have got into several of our dictionaries. Some have censured us for having called the present work by this name; not considering that names and titles of books, engines, instruments, &c. are in a great measure arbitrary; and that authors make no scruple even of coining new words on such occasions, when there are no old ones to their mind. Thus it is Dr. Hooke calls

calls his fine book of microscopical observations, Micrographia; Wolfius his book on the air, Aerometria; Drake his book of anatomy, Anthropologia, &c.; all of them words of modern, if not of their own fabric; and on no better authority stand the names of half our later inventions, as *microscope, telescope, barometer, thermometer, micrometer, &c.* But it is suggested the word cyclopædia is ambiguous, and may denote the *science of a circle*, as well as the *circle of sciences*: we answer, that as custom, the only sovereign rule of language, has determined the word to the latter sense, it is no more chargeable with ambiguity than a thousand other words of received use; no more, for instance, than *micrometer*, which might either denote a *little measure*, or a *measure of little things*.

CYCLOPES, in *Entomology*, a class of the monocus genus of insect, according to Muller, with two or four antennæ. See MONOCULUS.

CYCLOPES, from *κύκλωρ*, and *ὄψ*, *eye*, in *Mythology*, a people who were said to inhabit the western part of the island of Sicily, in the primitive times, together with the Læstrigones. According to Justin, Pliny, Solinus, and Thucydides, they were the first inhabitants of this island; and they are said to have settled in the territory of Leontium, and the districts in the neighbourhood of mount Ætna. Their origin, however, was unknown; and Thucydides acknowledges, that he knew neither the country from which they came, nor that to which they afterwards removed. According to Hesiod they were the sons of Ouranus and Tellus, or of heaven and earth; but of Neptune and Amphitrite, according to Euripides and Lucian. They were called Cyclopes from their being described with but one eye, placed in the middle of their forehead, and were of gigantic stature: they were said to be the companions of Vulcan. They are represented as a people lawless, savage, and delighting in human flesh; which character arose from the cruel custom of sacrificing strangers whom fortune brought upon their coast. It is related that Apollo killed the principal among them, for having forged the thunder-bolts which Jupiter hurled against his son Æsculapius. The adventures of Polyphemus, the chief of these people, whose residence was near the foot of mount Ætna, with Ulysses and Galatea, are well known.

The explanation of this allegory has been represented to be man in a state of uncultivated nature; unskilled in the laws of civil society, and living in a state of brutal force, having but one sense, which was sight. Him Ulysses overcame by superior knowledge and experience. Homer, in his "Odyssey" (l. ix. v. 106, &c.), describes the Cyclopes as having no laws. Each, he says, governs his family, and rules over his wife and children. They trouble not themselves with their neighbours, and think not themselves interested in them. Accordingly, they have no assemblies to deliberate on public affairs; they are governed by no general laws to regulate their manners and their actions. They neither plant nor sow: they are fed with the fruits which the earth produces spontaneously. Their abode is in the summits of mountains, and caverns serve them for a retreat. Such is Homer's account of them. But though the Greek and Roman poets, and even Strabo, together with other respectable writers, have taken it for granted, that the Cyclopians of Homer were near Ætna in Sicily; the poet does not once mention the island in his whole account of the Cyclopes; nor does Ulysses arrive in Sicily till after many subsequent adventures. His Cyclopians were, therefore, inhabitants of the continent. There were probably people of the same family in many parts of Sicily, who seem to have been of the Anakim race, and worshippers of the sun; espe-

cially about the city Camarina. The fable of their having only one eye, some have explained by observing, that they were the archers of their times, and that they usually shut one eye to take their aim in shooting. (Shuckford's Connection, vol. iii. p. 52.)

The Cyclopes, according to Dr. Bryant, were a tribe of the ancient Amonians, of a size superior to the common race of mankind, who settled in many parts of Greece. They were famous for architecture; and the idea of this people was borrowed from the lofty towers which they erected. As these buildings were often light-houses, and had, in their upper story, one round casement, by which they afforded light in the night, the Greeks made this circumstance a characteristic of the people. They supposed this aperture to have been an eye, which was fiery and glaring, and placed in the middle of their foreheads.

The Cyclopians, says Pausanias (lib. ix. p. 785), were truly wonderful for the temples which they erected to the gods, and for the stately edifices which they built for men. When the Sibyl in Virgil shows Æneas the place of torment in the shades below, and leads him through many melancholy recesses, we find that the whole was separated from the region of bliss by a wall constructed by the Cyclopians. The Sibyl accordingly at their exit tells him:

"Cyclopium educta Carminis
Mœnia conspicio." Æn. l. vi. v. 630.

From hence we find that they were the reputed builders of the infernal mansions: a notion which arose from the real buildings about the infernal regions, and the torments of hell, were taken from the temples in each country; and from the rites and inquisition practised in them. The Cyclopians, however, were more than imaginary operators. They founded several cities in Greece; and constructed many temples to the gods, which were of old in high repute. The Scholiast upon Statius (Thebaid. l. i. p. 26.) observes concerning them, that every thing great and noble was regarded as Cyclopians. These people are said to have built the ancient city of Mycene, which Hercules in Seneca threatens to ruin.

"Quid moror? majus mihi
Bellum Mycenis restat, ut Cyclopea.
Everfa manibus mœnia nostris concidunt."
Hercules Furens, act. iv. v. 996.

They likewise built Argos; which is mentioned by Thyestes in Seneca (Act. ii. v. 406.) as a wonderful performance.

"Cyclopium Sacras
Turres, labore majus humano decus."

They built also several other cities in Greece, as Hermione, an ancient city, which stood near a stagnant lake, called the pool of Acherusia, and a deep cavern, which was supposed to be the most compendious passage to the shades below, near which yawning cavern the Cyclopians chose to take up their habitation (Strabo, lib. viii. p. 573.):—Tiryns, the walls of which were esteemed no less a wonder than the pyramids of Egypt (Pausan. l. ii. p. 147. l. ix. p. 783. Strabo, l. viii. p. 572.):—and they resided at Nauplia in Argolis, near which city were caverns in the earth, and subterraneous passages, consisting of labyrinths cut in the rock, like the Syringes in Upper Egypt, and the maze at the lake Moeris, which were reported to be the work of Cyclopians. Euripides (Herc. Furens, v. 944.) speaking of the walls of ancient Mycene, as built after the Phœnician

Phœnician rule and method, ascertains the country from which the Cyclopians came: the Phœnicians alluded to being the Φαίνοι of Egypt, to which country they are principally to be referred. The seven Cyclopes, who, according to Strabo (l. viii. p. 572.), built Tiryns, were, as Bryant suggests, seven Cyclopians towers built by these people; some of which were situated towards the harbour, to afford light to ships, when they approached in the night. These towers were likewise erected for Purait, or Purathœia, where the rites of fire were performed. Mr. Bryant conceives, that not only the common idea of the Cyclopians was taken from towers and edifices; but that the term Κυκλωψ, and Κυκλωπις, Cyclops, and Cyclopius, signified a building or temple, and from thence the people had their name. They were of the same family as the Cadmians and Phœnicians; and as the Hivites, or Ophites, who came from Egypt, and settled near Libanus and Baul-Hermon, upon the confines of Canaan. They worshipped the sun under the symbol of a serpent: and hence they were styled, in different parts where they settled, Europians, Orpians, Inopians, Afopians, Elopians; all which names relate to the worship of the Pytho Ops, or Opis. Our learned author does not determine the precise etymology of the term Κυκλωψ, Cyclops; but as a perforage, he was said to have been the son of Ouranus and the earth; which Ouranus, among the Amonians, was often styled Coel, or Cœlus, and was worshipped under the emblem of a serpent. Hence the temple of the deity might originally have been called Co-Cœl-Ops, domus Cœli Pythous; and the priests and people Cyclopians. The Cyclopians deity was, therefore, Ouranus, and the Cyclopians were his priests and votaries. Some of the Cyclopians race settled in Thrace, where was a place called Cyclops; and many of the Amonians came thither; so that Thrace seems at one time to have been the seat of science, and the Athenians acknowledged that they borrowed largely from them. The head of Medusa in Argolis is said to have been the work of Cyclopians (Pausan. l. ii. p. 156.) This head seems to have been an ancient hieroglyphical representation upon the temple of Cephissus. The head of Medusa, like other devices upon temples, was esteemed a kind of talisman, and supposed to have an hidden and salutary influence, by which the building was preserved. It is probable that this opinion induced the Athenians to exhibit the head of Medusa upon the walls of their acropolis. The notion of the Cyclopes forming the thunder and lightning for Jupiter, arose chiefly from their engraving hieroglyphics of this kind upon the temples of the deity. Hence they were represented as persons,

“Ὁ Ζηνὶ βροχίαν τ' ἰδρῶσαν, τρυχῶν τε κερῶσιν.”

Hesiod. Theogon. v. 141.

The poets considered them merely in the capacity of blacksmiths, and condemned them to the anvil. This, Mr. Bryant apprehends, arose from the chief Cyclopians deity being called Aemon, and Pyracmon; and under the former title he was worshipped in Phrygia. As the Cyclopians were great artificers, they were probably famous for works in brass or iron; and this circumstance in their history may have been founded in truth. The Idæi Daetyli were Cyclopians; and they are said to have first forged metals, and to have reduced them to common use:—the knowledge of which they obtained from the fusion of minerals at the burning of mount Ida. From this event the Curetes and Corybantes, who were the same as the Idæi Daetyli, are supposed to have learned the mystery of fusing and forging metals. From them it was propagated to many countries westward, particularly to the Pangæan mountains, and the

region Curetis, where the Cyclopians dwelt in Thrace;—and also to the region Trinacia and Leontina near Ætna, which they occupied in Sicily.

After tracing very much in detail the true history and antiquity of the Cyclopians, Mr. Bryant infers from their works, that there was a time when they were held in high estimation. They were denominated from their worship; and their chief deity, among other titles, was styled Aemon, and Pyracmon. They seem to have been great in many sciences; but the term Aemon signifying among the Greeks an anvil, the poets have limited them to one base department, and considered them as so many blacksmiths. And as they resided near Ætna, they have made the burning mountain their forge:

“Ferrum exercebant vasto Cyclopes in antro,
Brontesque, Steropesque, et nodus membra Pyracmon.”
Æn. l. viii. v. 424.

Bryant's Analysis of Anc. Mythol. vol. i.

CYCLOPIS INSULA, in *Ancient Geography*, an island of the Mediterranean sea, upon the coast of Asia Minor, and near the island of Rhodes. Pliny.

CYCLOPS, ROCKS OF, in *Geography*, three rocks of lava, which are termed islands because they are surrounded by the sea, situated about a stone-throw's distance from the shore of Sicily, on which the village of Trezza stands. These rocks, which are mentioned by Pliny, might once have formed a part of the sides of Ætna, and have been separated from them by the sea; or they may have been thrown up out of the water by partial eruptions. Some of these rocks appeared to Spallanzani, who examined them, to consist externally only of prismatic columns, that fall perpendicularly into the sea, in some places one foot long, in others two, and in others more; but other parts of these rocks are only full of irregular fissures, which have divided them into pieces, as we see in common lavas. M. Dolomieu found on the surface of these rocks, and even in the middle of their substance, where are small pores and cavities, various and numerous zeolites of great beauty. This ingenious naturalist thinks, that these stones, after the congelation of the lavas, derived their origin from the waters which filtrated through them, and held in solution the particles proper for the production of zeolites. See Spallanzani's Travels, vol. i.

CYCLOPTERUS, in *Ichthyology*, a genus of branchiostegous fishes, distinguished by having the head obtuse; mouth in the anterior part; tongue short and thick; and the jaws beset with a number of small acute teeth; gill-membrane four-rayed, the cover of one piece; body short, thick, and destitute of scales; ventral fins united into an oval concavity, and forming an instrument of adhesion. The species of this genus are of the marine kind, and subsist on worms, insects, and the fry of other fishes; and they are furnished beneath with an oval or roundish organ of adhesion, by means of which they have the power of fastening themselves to the rocks so firmly, as to require considerable force to remove them. The species of this genus are not very numerous.

Species.

LUMPUS. Body angulated by rows of sharp bony tubercles. Linn. *Lumpus angulorum* Gœfuer. Common lump-sucker, Donovan. Brit. Fishes, &c.

This fish inhabits the northern seas, and grows to the length of eighteen inches or two feet; the body thick and uncouthly formed; its colour variable; the prevailing hue on the upper part of the body is usually blueish, tinged

with purple, and rough with innumerable dusky papillous dots; the sides pale, and the belly vivid scarlet; the pectoral fins are orange radiated with red, and the eyes bright red. Specimens sometimes occur of a fine and tender green, glossed with silvery, the back blue, and the sides pale rosy. This variety we have obtained more than once, (vide *Donov. Tour South Wales*.) and are satisfied it is only a variety of the common fort. Dr. Shaw describes it as a distinct species, under the title of *pavonian sucker*. The pyramidal sucker (*lumpus pyramidatus*) of the latter writer is not a different species, nor even a natural variety, but an example of the common kind capriciously distorted by art, as is sufficiently demonstrated by the specimen from whence Dr. Shaw's description was taken. The specimen alluded to was formerly preserved in the Leverian Museum, and is at present included in the London Museum. A third variety is described as having the dorsal fin very long, examples of which we have not seen.

The common lump-sucker is found on the northern coasts of Britain, during spring, in vast numbers, where they become the prey of seals, who lurk beneath the surface of the water. It is easy to distinguish the place where the seals are devouring these or any other unctuous fish, by the smoothness of the water immediately above the spot. Great numbers of these fishes are found on the coasts of Greenland in April and May, when they resort to the shores to spawn. The natives call them *nipifets* or *cat-fish*, and admire them as an article of food, being of a very unctuous nature. In England it is also sometimes eaten, stewed in the manner of carp, or broiled; in which latter case the head and skin are taken off, and the flesh cut into slices.

MINUTUS. Body naked; snout above the mouth, with three tubercles. Linn.

A species of small size, allied in its general aspect to the former species. The colour is white; the body compressed, with two white unequal bony tubercles on each side. The head is thicker than the body, nearly square, and obtuse in front; the vent placed nearly in the middle of the body, and instead of a dorsal fin, a long and tapering recurvate spine. The pectoral fins are yellow; the tail entire and equal; the organ of adhesion oval, with dilated and seven lobate margin. This fish inhabits the Atlantic sea.

NUDUS. Body naked; head with a single spine each side on the posterior part. Linn.

A native of India, and of small size.

DENTEX. Body naked; head unarmed, very smooth; fins separate. Pallas. *Spicil. Zool.* 7. t. 1. f. 1-4.

This species inhabits the American seas. The head is very large and much broader than the body, depressed and flat beneath; the lips thick, wrinkled, and doubled, with two very soft fleshy caruncles within; the gill-covers large and bony; vent situated near the tail. The general colour reddish.

VENTRICOSUS. Body naked; urinary vessel double, very large, and distending the belly. Pallas. *Spic. Zool.*

Inhabits the sea between Kamtschatka and America. Its length is about twelve inches; the body olive covered, with a thick slimy livid mucus; back flattish, with the tail suddenly tapering behind the vent.

GELATINOSUS. Body gelatinous, and sub-transparent; pectoral fins very broad. Pallas.

Found in the eastern parts of the same seas as the preceding. This fish is about eighteen inches in length; the body very slender, oblong, compressed, thicker towards the head, and gradually tapering towards the tail, of a whitish colour tinged with rosy; the skin smooth and very soft, and when just caught is said to tremble like jelly. The flesh is not

eatable, being refused even by the Kamtschatkan dogs, which are fed during part of the year with fish of various kinds.

LIPARIS. Body naked; dorsal, anal, and caudal fin united. Bloch.

A general inhabitant of the northern seas, and sometimes found on the coasts of Britain. The length is from five to sixteen inches; its shape thick towards the head, and becoming attenuated and compressed towards the tail. *Donov. Brit. Fishes.*

LINEATUS. Body naked, and marked with longitudinal bluish lines; dorsal and anal fins running gradually into the tail. *Lepechin. Nov. Com. Petrop.*

A beautiful species, in its general aspect much resembling the last. *Lepechin* found it in the White Sea, and described it in the *Transactions of the Petersburgh academy*. This rare fish has also once been met with on the British coasts. It is described in *Donovan's Hist. British Fishes*; and the specimen itself, from which the figure and account are taken, is arranged with the other British cyclopteri in the London Museum.

OCELLATUS. Body naked, tapering towards both ends; two large dorsal ocellated spots near the shoulders, and before each eye a bifurcated process. *Donov. Brit. Fishes. Jura sucker. Penn. Lesser sucking fish. Borlase.*

Length four or five inches; a very local species found on the coast of Scotland, and on those of Cornwall and Devonshire in Britain; and in some others of the European seas.

BIMACULATUS. Body naked, attenuated behind, and rosy, with a purple spot surrounded by a white ring on each side the abdomen. *Donov. Brit. Fishes. Bimaculated sucker. Penn.*

A small species, found on the coast of Devonshire.

MONTAGUI. Body naked, lanceolate, diaphanous, tinged with reddish and spotted with fuscous; dorsal, anal, and caudal fin distinct; organ of adhesion oval. *Donov. Brit. Fishes.*

A new and very beautiful species of a small size, discovered lately on the coast of Devonshire.

CYDARA, in *Ancient Geography*, a river placed by *Pliny* in the northern part of the island of *Taprobana*.

CYDARUS, a stream of *Thrace*, in the vicinity of *Constantinople*.

CYDDESES, a people of *Asia*, placed by *Ptolemy* on the confines of *Bithynia*.

CYDER, in *Rural Economy*, is a fruit liquor prepared by means of fermentation, from the expressed juice of different sorts of apples. The process by which this liquor is formed has much similarity in all the different districts where it constitutes an object of the farmer, though there is much diversity in regard to the care and management which are bestowed upon it.

The varieties of apples which are grown and cultivated in the various fruit districts of the kingdom, with this intention, are extremely numerous; but by some it is supposed that all such as have a yellow or light red ground, are tinged with red streaks on the sun side, having a smart acid flavour, with a firm juicy parenchyma and an aromatic flavour, whatever the name may be, are unquestionably proper for cyder. It has, however, been remarked by *Mr. Knight*, that the properties which are essential for cyder and the table are rarely met with in the same fruit. That degree of firmness which is necessary in the eating apple, is useless in the cyder fruit; and colour, which is disregarded in the former, is amongst the most important qualities of the latter. Some degree of astringency, which is prejudicial in the eating fruit,

CYDER.

fruit, is conceived beneficial in that made use of for cyder. In Devonshire, according to Mr. Vancouver's Survey, a rich sweet fruit is generally preferred for the purpose of cyder, while in others those which have more astringency are held in the highest estimation. See APPLE, APPLE-TREE and ORCHARD.

Gathering the Fruit.—In the business of gathering the fruit for this liquor, much care should be taken that it be sufficiently ripe before it is removed from the trees, otherwise the cyder will be harsh, rough, and unpleasant in its taste, in spite of any thing that can be done in the process of making it. The most certain indications of ripeness, according to Mr. Crocker, are the fragrance of the smell, and the dropping of the apples from the trees in a spontaneous manner.

The most early ripe fruits should, of course, be first gathered, but as on the same trees the fruits rarely become equally ripe at the same period of time, it is found necessary to throw them together into large round heaps in the open air, as noticed below, in which state they are suffered to continue for some time, until a sort of sweating or fermentation has been brought on, which induces a similar state of mellowness and fitness for grinding in the whole heap. This method, however, which requires much judgment in directing it, does not, even under the most careful management, always answer the purpose; therefore the nearer the apples approach towards perfect ripeness the better, as their juice is the more rich.

Mr. Crocker advises that in a dry day, when the fruit has acquired such a state of maturity as to be ready to drop from the tree, that the limbs or branches of it should be slightly shaken, and disburthened in a partial manner of its apples, thus taking only such as are in a ripe state, leaving the others to acquire a due degree of maturity. It is indeed suggested as proper to make three gatherings of the crop, keeping each of them by itself.

The latter gatherings, as well as the wind-falls, can, however, only be employed in making inferior cyder: the prime cyder must be drawn from the first gatherings which have been made.

According to Mr. Knight, the merit of cyder will always depend much on the proper mixture, or rather on the proper separation of the fruits. Those whose rinds and pulp are tinged with green, or red without any mixture of yellow, as that colour will disappear in the first stages of fermentation, should be carefully kept apart from such as are yellow, or yellow intermixed with red. The latter kinds, which should remain on the trees till ripe enough to fall without being much shaken, are alone capable of making fine cyder. Each kind should be collected separately, as noticed above, and kept till it becomes perfectly mellow. For this purpose, in the common practice of the country, they are, as stated above, placed in heaps of ten inches or a foot thick, and exposed to the sun and air, and rain; not being overcovered except in very severe frosts. The strength and flavour of the future liquor are however, he says, increased, by keeping the fruit under cover some time before it is ground; but unless a situation can be afforded it, in which it is exposed to a free current of air, and where it can be spread very thin, it is apt to contract an unpleasant smell, which will much affect the cyder produced from it. Few farms are provided with proper buildings for this purpose on a large scale, and the improvement of the liquor will not nearly pay the expence of erecting them. It may reasonably be supposed that much water is absorbed by the fruit in a rainy season; but the quantity of juice yielded by any given quantity of fruit will be found to diminish as

it becomes more mellow; even in very wet weather, provided it be ground when thoroughly dry. The advantages therefore, of covering the fruit, will probably be much less than may at first sight be expected. No criterion appears, the writer says, to be known, by which the most proper point of maturity in the fruit can be ascertained with accuracy; but he has good reason to believe that it improves as long as it continues to acquire a deeper shade of yellow. Each heap should be examined prior to its being ground, and any decayed or green fruit carefully taken away. The expence of this will, he observes, be very small, and will be amply repaid by the excellence of the liquor, and the care with which too great a degree of fermentation may be prevented in the process of making it into cyder.

Mr. Crocker has likewise remarked that the cyderist, who would be particularly curious in his prime liquor, should hand-gather his fruit, and keep the sorts separate one from another: but as this would be troublesome, expensive, and in a full season wholly impracticable, the general crop may, at different times, be shaken down, and collected from the ground. Fruit of equal ripeness, and whose qualities are nearly alike, should be heaped together, to meliorate their juices, or, in other words, to perfect the saccharine fermentation. How this is best done, cyder-makers are not, the writer says, agreed: some, says he, judging it altogether unnecessary to keep them at all, if sufficient time be allowed for perfecting the saccharine fermentation on the tree: some considering it best to sweat them in close lofts, whilst others allege, that the open air is the only place where they ought to be heaped. Experience, however, should, he thinks, teach us that most apples require time for their being mellowed, to attain their highest flavour; and, until this mellowing be perfected, their juices are not in the best state possible for being converted into cyder-liquor.

However, philosophy has shewn, he thinks, that fermentation is never improved by hastening the operation with too much heat; nor perfected in due time under too great an exposure to cold. It would be well, therefore, says he, if apples, when gathered from the tree, were placed in open sheds, having boarded floors, in heaps or layers of ten or twelve inches deep; the hard and harsh fruits might probably, he supposes, be laid in heaps of greater depth; the sorts to be kept separate, as much as the nature and conveniences of the sheds will allow: at any rate there must be a mixture of apples in the same heap; let them, says the writer, be such as are of qualities nearly alike, and which are of equal ripeness at the time of gathering, but on no account should sweet and sour fruit be heaped together. To some cyderists it may, says he, have appeared unnecessary to keep the different sorts of apples separate, but it is of importance so to do: and the trouble is very little, as has been observed, compared to the advantages which will hereafter result from a regular fermentation of the juices. The impropriety of housing and laying apples in very large heaps must, the writer thinks, be manifest to every thinking mind; more especially when in the same room are found all sorts; sweet, sour, harsh, generous, ripe, and unripe, thrown promiscuously together; where some are rotten before others are mellowed. And what must the liquor be, he asks, which is expressed from such an heterogeneous mass?

In respect to heaping, the author of the Survey of Gloucestershire well remarks, that though it may improve unripe fruit, it cannot communicate the richness found in that which is fully ripened. And that the effect which is thus produced on those which are heaped in a very green and

and unripe state, is rottenness, in which condition very few are capable of communicating an unpleasant flavour, even to a very large quantity of the liquor, especially where they have become of a black appearance.

Supposing, says Mr. Crocker, that the fruit, which is of different sorts and qualities, has been kept separate from one another a few weeks, it will be perceived that some of the prime sorts are in a proper state of maturation; that the pulp has acquired its highest degree of richness; the kernels assumed their brownest colour; the rind still free from any appearance of rottenness; and that they readily yield to the pressure of the thumb: then is the time, says he, and such is the fruit to be employed in making prime cyder: every necessary utensil must now be set in order: the mill, press, tubs, casks, pails, and bowls, clean washed, and suffered to dry before they are employed in the business.

The able writer of the Agricultural Report of the County of Gloucester very strongly and very justly reprobates the too common practice of those who indiscriminately, and without any regard to the maturity of the fruit "run over the whole orchard with the beating pole, or 'lug,' and bring down every apple within their reach," as thus beating the trees before the fruit is nearly ripe is not only injudicious in respect to the cyder, but injurious to the succeeding year's crop of fruit; the bearing buds for the next season being formed early in the summer near, and even attached to, the growing fruits. Of course, the beating of the trees, unless where the apples separate with facility, must of necessity bring off the buds which nature had provided for the ensuing year, with them. And he adds that, "after an operation of this kind the ground is strewed with these buds, to an extent scarcely to be conceived by those who have not witnessed it." The practice of the most careful farmer is therefore, he says, to have the trees "shaken limb by limb, by a person up in the tree," only suffering the few that remain to be beaten off, and occasionally even allowing them more time to ripen, which he considers by far the best practice, except that of suffering them to fall of their own accord, as securing a regular fermentation with less keeping.

Grinding the Apples. In the business of grinding the fruit for this use, into what is termed pomage, several different methods are practised: but those most commonly in use are the bruising-stone, with a circular trough, and the apple-mill. In the first of these methods the apples are thrown into the trough, and bruised by the motion of the stone, as it is moved round by a horse, in the usual way that tanners grind their bark. This is a very ancient method, and which is still in use in some parts of Devonshire, and although it has its inconveniences, in bruising some apples too much and some too little, it is not without its advocates in these parts of the country; the inhabitants of which allege, that it bruises the kernels of the fruit better than other machines. Although it must be admitted, that the kernels possess an agreeable aromatic bitter, yet it has been held questionable if they impart any perceivable beneficial quality to the cyder. Be this as it may, certain it is, that this method of converting apples to pomage by the trough and stone has, in the last fifty years, much given way to the apple-mill.

The author of the treatise on the apple and the pear has remarked that when iron mills have been tried, this metal has been found to be soluble in the acid of apples, to which it communicates a brown colour and an unpleasant taste. No combination has, he believes, been ascertained to take place between this acid and lead; but as the oxyd or calx

of this metal readily dissolves in, and communicates an extremely poisonous quality to, the acetous juice of the apple, it should, he thinks, never be suffered to come into contact with the fruit or liquor. In the construction of these mills, there are various methods had recourse to in regard to their motion or moving powers, some being worked by hand, some by horses, and others by water. The horse and water powers have obviously considerably the advantage in the quantity of work that is capable of being performed; but the hand method is supposed capable of reducing the pulp into a state of greater fineness, where the latest improvements in mills of this kind have been adopted. See *CYDER-Mill*.

It has been suggested in the Herefordshire report, that each sort of apples should be ground separately, or at least such sorts in mixture as become ripe at the same time; but on the authority of Mr. Appesley of Withington and other manufacturers, it is stated, that the former practice is that by which "fine cyder of different flavours and degrees of strength is obtained, from the same orchard, the liquors being mixed after they are made." It is however allowed that "in all common cases," the practice of grinding different varieties of fruit equally ripe, together, is found eligible; as it is less difficult to find the requisite degrees of richness, astringency, and flavour, in three varieties, than in one. And hence it is supposed that cyders made from the juice of mixed fruits under common management, generally succeed with greater certainty, than those from only one kind. In the grinding, the fruit should be reduced as nearly as possible to an uniform confistence, in such a manner as that the rinds and kernels may be scarcely discernible from the general mass; the operation proceeding slowly, with a free access of air. The quantity of fruit which is usually thrown into the cistern at one time to be ground, is about two bushels in the large mills.

Pressing the ground fruit.—It is remarked by Mr. Crocker, that cyderists are not agreed in opinion, whether the pomage should immediately after grinding be conveyed to the press, there to be formed into a kind of cake, or what is sometimes called the cheese; or whether it should remain some time in that state before pressing. Some say it should be pressed immediately after grinding; others conceive it best to suffer it to remain in the grinding trough, or in vats employed for the purpose, for twenty-four hours, or even two days, that it may acquire not only a redness of colour, but also that it may form an extract with the rind and kernels. Both extremes are, he thinks, wrong. There is an analogy, he supposes, between the making of cyder from apples, and wine from grapes; and the method which the wine-maker pursues ought, he thinks, to be followed by the cyder-maker. When the pulp of the grape has lain some time in the vats, the vintager thrusts his hand into it and takes some from the middle of the mass; and when he perceives by the smell that the luscious sweetness is gone off, and that his nose is affected with a slight piquancy, he immediately carries it to the press, and by a light pressure expresses his prime juice. In like manner should the cyderist determine the time when his pulp should be carried to the press. If he carry it immediately from the mill to the press, he might lose some small advantage, which may be expected from the rind and kernels, and his liquor may be of lower colour than he might wish. If he suffer it to remain too long unpressed, he will find to his cost, that the acetous fermentation will come on before the vinous is perfected; especially in the early part of the cyder-making seasons. He will generally find, he thinks, that his pulp is in a fit state for pressing in about twelve or sixteen hours. If

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he must, of necessity, keep it in that state longer, he will find a sensible heat therein, which will engender a premature fermentation; and he must not delay turning it over, thereby to expose the middle of the mass to the influence of the atmosphere. Mr. Knight, however, thinks it should remain twenty-four hours before it is taken to the press. And the writer of the "General view of the state of agriculture in the county of Gloucester," states that there the pulp is either immediately carried to the press, or, which is better, laid up in tubs or open casks for twenty-four hours; by which the colour is improved, and by the digestion which takes place, a more intimate union of the rind, kernel, and stalk juices are produced, especially when again carried to the mill and reground. See *CYDER-Press*.

The ground fruit or pommage being new in a proper state, it is carried to the press, and a square cake or cheese made of it, by placing very clean sweet straw or reed between the various layers of pulp or pommage; or by putting the same into hair-cloths spread upon the vat, and placing them one on another. They are turned up on the sides and corners over the pulp, so as to nearly meet in the centres. They are laid very even, ten or twelve being thus applied over each other in regular layers, the square frame of the press being raised with them, keeping the pile to a uniform size. Upon the whole, a strong board is placed, wider than the pile, on which the blocks of the press rest. It is of importance that the straw or reed, where they are used, be sweet and perfectly free from any fustiness, lest the cyder be impregnated therewith. Particular care ought also to be taken to keep the hair-cloths sweet, by frequently washing and drying; or the ill effects of their acidity will be communicated to the cyder. To this cake or cheese, after standing a while, a slight pressure is at first to be given by lowering the screw of the press, which must be gradually increased as the cakes become dryer, until all the must or juice is expressed, which is usually completed by the long lever and windlafs: after which, the juice must be strained through a coarse hair sieve, to keep back the gross feculencies of the juice, and be put into proper vessels. These vessels may be either open vats, or close casks; but as in the time of a plentiful crop of apples, a number of open vats may by the cyderist be considered an incumbrance in his cyder-rooms, the must should be generally carried immediately from the press to the cask. The pressed pulp or cheeses, as they are termed, on being removed from the press and taken out of the cloths, are thrown away, when not designed for further use; but when the crops are scanty they are sometimes laid by in some places, to be afterwards reground with water, from which is afforded a liquor of weak quality, which is denominated in some places *washings*, but of sufficient strength to render it fit for family use; as notwithstanding the utmost attention in grinding, and the greatest exertion of the press, some portions of the fruit remain unexpressed, which contain juice in an unexpressed state. It is found that the residue of a quantity of fruit, sufficient for making three hogheads of cyder, is capable of yielding about one hoghead of washings.

Fermenting, racking, and casking the liquor.—These are the next operations to be regarded in the manufacture of this liquor. It is suggested by Mr. Crocker, that cyder-making is thus far a mere manual operation, performed with very little skill in the operator; but that now it is that the great art of making good cyder commences: nature soon begins to work a wonderful change in this foul-looking, turbid, fulsome, and unwholesome fluid; and, by the process of fermentation alone, converts it into a wholesome, vinous, salubrious, heart-cheering beverage. He thinks

that philosophy has shown, and that experience justifies the position, that the juices of all vegetables, when exposed to certain degrees of heat and atmospheric influence, are disposed by nature to spontaneous intestine motions of their constituent parts: this is called fermentation.

And it is observed by Mr. Knight, that the juice of the apple in its unfermented state consists of sugar, vegetable mucilage, acid, water, its tingeing matter, the principle of smell, and, he believes, of astringency. Of these component parts, the first only is known to be capable of producing ardent spirit, and it might thence be inferred that the strongest cyders would be afforded by the sweetest fruits: but the juice of these generally remains defective in what is termed "body" in liquors, and it is extremely apt to pass from the saccharine to the acetous state. Much of the strength of cyder is supposed by the Herefordshire farmers to be derived from the rind and kernels of the fruit, and hence arises their great attention to grind it thoroughly; the stalks also are necessarily reduced, when the apples are thoroughly ground, and he suspects that the body of the liquor is strengthened, and its flavour improved by the astringent juice of these: yet it does not appear probable, he says, that either of them contains any saccharine matter.

It is further stated as well-known that there are various kinds of fermentation in the juices of all vegetables, each of which changes the very nature and quality of the fluid; but the principal ones which are to be particularly attended to, in the instance now under consideration, (the must or juice of apples,) are these; namely, the vinous, the acetous, and the putrefactive. The first converts the must from its turbid, fulsome state to a transparent spirituous liquor, lightly piquant on the palate, resembling wine both in its flavour and effects.

The above writer states in addition, that it has been observed to take place in such bodies only as contain a considerable portion of sugar, and that it is always attended with the decomposition of that substance. The liquor gradually loses its sweetness, acquiring an intoxicating quality, and by distillation affords a greater or less quantity of ardent spirit, according to the quantity of sugar it originally contained, and the skill with which the process has been conducted. When this fermentation proceeds with too much rapidity, it is often confounded with the acetous, but the products of that are totally different. A violent degree of fermentation however, though purely vinous, is extremely injurious to the strength and permanence of cyder, probably owing to a part of the ardent spirit being discharged along with the disengaged air or gas.

"If," says the author of the *Treatise on Cyder-making*, "the juice has been expressed from four apples, this fermentation is perfected in two or three days; but if from sweet apples, not under a week or ten days, and sometimes longer."

The next succeeding stage of fermentation gives an acidity to the vinous liquor before spoken of, converting it to a sort of vinegar. This fermentation begins soon (frequently in a few hours) after the vinous is ended, and if the fermentation be improperly hastened by heat, before the vinous can be perfected. And Mr. Knight has remarked that it usually succeeds the vinous; but that it will sometimes precede it, when the liquor is in small quantity and exposes a large surface to the air. In this process, vital air is absorbed from the atmosphere, and the ardent spirits, vegetable acid, and sugar, if any remain, are alike converted into vinegar.

It is also further remarked that in the putrefactive process which follows the acetous, the vinegar loses its acidity,

becomes foul and viscid, and emits air of an offensive smell: an earthy sediment subsides, and the remaining liquid is little but water. But although we cannot, Mr. Crocker thinks, form any clear and distinct knowledge of the precise manner in which nature performs these changes in fermenting liquors, yet the effects are evident; and from a consideration of the different natures and results of the various fermentations, it may be perceived, that the first is the only one useful in making good cyder, and that the others tend to vitiate, and render unwholesome a liquor that would otherwise be highly pleasant, and truly salubrious. To regulate the first and to check the others, is then, says he, the greatest business of that cyder-maker, who would attach to himself the satisfaction and fame which every one is emulous of acquiring and deservng.

In the view of attaining these ends, fermentations should not, he thinks, by too much heat, be carried on rapidly, nor by extreme cold, too slowly; as, in each case, the fermenting body must be injured. Hence (he says) it appears, that a certain degree of warmth, or rather imperceptible heat, conduces best to regulate this operation. This degree of warmth may be understood to rest between forty and fifty degrees of Fahrenheit's thermometer. If then the warmth of the cellar, in which new-made cyder is placed, be between these points (no adventitious cause interfering), we may expect that the vinous fermentation will commence and go on with due regularity, and in a proper manner.

It has been observed above, that fermentation is an intestine motion of the parts of a fermentable body. This motion, in the present case, is always accompanied with an evident ebullition; the bubbles rising to the surface, and there forming a scum, or soft and spongy crust, over the whole liquor. This crust is frequently raised and broken by the air as it disengages itself from the liquor, and forces its way through it. This effect continues whilst the fermentation is brisk, but at last gradually ceases. The liquor now appears tolerably clear to the eye, and has a piquant, vinous sharpness upon the tongue. If in this state the least hissing noise be heard in the fermenting liquor, the room is too warm; and atmospheric air must be let in at the doors and at the windows.

"This (continues he) is the critical moment, which the cyderist must not lose sight of; for, if he would have a strong, generous, and pleasant liquor, all further sensible fermentation must be stopped. This is best done by racking off the pure part into open vessels, which must be placed in a more cool situation for a day two, after which it may again be barrelled, and placed in some moderately cool situation for the winter. The Herefordshire cyder-farmers, after the cyder has perfected its vinous fermentation, place their casks of cyder in open sheds throughout the winter: and, when the spring advances, give the last racking, and then cellar it. In racking, it is advisable that the stream from the racking-cock be small, and that the receiving-tub be but a small depth below the cock: lest, by exciting a violent motion of the parts of the liquor, another fermentation be brought up.

Though in common practice the racking of the liquor is rarely much attended to, especially for some months after casking, this being the old method; there cannot, however, be much doubt but that it should be accomplished at the proper moment as shewn above: in proof of which it is found that in the management of the finer liquors, in some districts, in which the fermentation is rapid, some have servants in constant attendance to watch its progress, racking it when necessary, even in the night, as such saccharine li-

quors require timely checking to prevent their taking on the acetous state.

But though frequent rackings have, without doubt, a tendency to reduce the liquor to a quiet state, the strength is supposed to be considerably lowered by it, in consequence of the continual escape of the spirit by exposure to the atmosphere. Brandy, or any other clean spirit may likewise be employed for the same purpose as racking, if not found too dear. The same object may also be obtained in some measure by leaving the cask unfilled, with an ullage. Where the tendency to fermentation is great, the casks should not be too much filled to the bung-hole, the action of the air on the surface of the liquor being favourable to the checking of that process.

The grounds, lees, or feculence of the cyder, after racking, may be strained through filtering bags, made for the purpose, of coarse linen or hempen cloth, and the running placed among the second-rate cyders; but by no means should it, in Mr. Crocker's opinion, be returned to the prime cyder. Some find it useful in checking any farther irregular fermentation in the casks. In this situation the cyder will, in course of time, by a sort of insensible fermentation, (the same writer says) not only drop the remainder of its gross lees, but will become transparent, highly vinous and fragrant.

"But, (it is observed by Mr. Knight,) that after the fermentation has ceased, and the liquor is become clear and bright, it should instantly be drawn off, and not suffered on any account again to mingle with its lees; for these possess much the same properties as yeast, and would inevitably bring on a second fermentation. The best criterion to judge of the proper moment to rack off will be (he says) the brightness of the liquor: and this is always attended with external marks, which serve as guides to the cyder-maker. The discharge of fixed air, which always attends the progress of fermentation, has entirely ceased; and a thick crust, formed of fragments of the reduced pulp, raised by the buoyant air it contains, is collected on the surface. The clear liquor being drawn off into another cask, the lees are put, he says, into small bags, similar to those used for jellies, being made, as noticed above: through these, whatever liquor the lees contain gradually filtrates, becoming perfectly bright, and it is then returned to that in the cask, in which it has the effect, in some measure, of preventing a second fermentation, as already hinted. It appears, he says, to have undergone a considerable change in the process of filtration. The colour is remarkably deep, its taste harsh and flat, and it has a strong tendency to become acetous; probably by having given out fixed, and absorbed vital air. Should it become acetous, which it will frequently do in forty-eight hours, it must not, on any account, he says, be put into the cask. If, however, the cyder, after being racked off, remains bright and quiet, nothing more is to be done to it till the succeeding spring; but if a scum collects on the surface, it must immediately be racked off into another cask; as this would produce bad effects, if suffered to sink. If a disposition to ferment with violence again appears, it will be necessary, he thinks, to rack off from one cask to another, as often as a hissing noise is heard. The strength of cyder is much reduced, he says, as noticed above, by being frequently racked off; but this, he supposes, arises only from a large portion of sugar remaining unchanged, which adds to the sweetness, at the expence of the other quality. The juice of the fruits which produce very strong cyders, often remains muddy during the whole winter, and much attention must frequently be paid, to prevent an excess of fermentation.

The casks into which the liquor is put, whenever racked off, should always have been thoroughly scalded, and dried again; and each should want several gallons of being full, to expose a larger surface to the air of the atmosphere.

But, says he, should the cyder-maker neglect the above precautions, the inevitable consequence will be this: another fermentation will quickly succeed, and convert the fine vinous liquor he was possessed of into a sort of vinegar; and all the art he is master of will never restore it to its former richness and purity.

When, however, the acetous fermentation has been suffered to come on, the following attempts may, he says, be made to prevent the ill effects of it from running to their full extent. For this purpose several means have been tried, sometimes with a degree of success, at other times wholly unavailably; the most popular ones would, however, seem to be these: as already noticed, a bottle of French brandy, half a gallon of spirit extracted from the lees of cyder, or a pailfull of old cyder, poured into the hogshhead soon after the acetous fermentation is begun: but no wonder, continues he, if all these should fail, if the cyder be still continued in a close warm cellar. To give effect to either, it is necessary that the liquor be as much exposed to a cooler air as conveniently may be, and that for a considerable length of time. By such means it is possible fermentation may, in a great measure, be repressed; and if a cask of prime cyder cannot from thence be obtained, a cask of tolerable second-rate kind may. These remedies are innocent; but if the farmer or cyder-merchant attempt to cover the accident, occasioned by negligence or inattention, by applying any preparation of lead, let him reflect that he is about to commit an absolute and unqualified murder on those whose lot it may be to drink his poisonous draught. Such means should, therefore, on no account be ever had recourse to.

The practice which is provincially termed *flumming*, and which signifies the fuming a cask with burning sulphur, may sometimes be advantageous. It is thus performed: take a stripe of canvas cloth, about twelve inches long and two broad; let it be dipped into melted brimstone: when this match is dry, let it be lighted, and suspended from the bung of a cask (in which there are a few gallons of cyder) until it be burnt out. The cask must remain stopped for an hour or more, and then rolled to and fro, to incorporate the fumes of the match with the cyder; after which it may be filled. If the *flumming* be designed only to suppress some slight improper fermentation, the brimstone match is sufficient; but if it be required to give any additional flavour to the cyder, some powdered ginger, cloves, or cinnamon, &c. may be brewed on the match when it is made. The burning of these ingredients with the sulphur will convey somewhat of their fragrance to the whole cask of cyder; but to do it to the best advantage, it must be performed as soon as the vinous fermentation is fully perfected.

It is stated by Mr. Crocker, that when the cyderist has succeeded in obtaining a favourable vinous fermentation, and by a well-timed racking and attention he has prevented the acetous and other succeeding fermentations from rising, his cyder will require very little further attention, more than filling up the vessels every two or three weeks, to supply the waste by the insensible fermentation, until the beginning of the succeeding March; at which time it may be reasonably expected he will find his cyder bright, pure, and in a fit state for its final racking. This should be done in fair weather; and, if necessary, a commixture should now be made of the high-coloured cyder, made from the Jersey,

or the luscious sweet apples, with that of the pale-coloured cyder from the poorer four apples: by which means a general regular colouring may be obtained with the least trouble, and without expence in any way.

Though it may be expected that the cyderist will now find his liquor to his mind, both in point of brightness and colour, yet should he be disappointed, this is the time for applying some innocent remedy to remove the disorder. He does not recommend to him either of the *forces* commonly used for fining liquors, namely, bullock's blood, singlafs, eggs, &c. as they as frequently spoil a cask of cyder as improve it; but if he put two pounds of lump sugar into a hogshhead of cyder, he will receive all the benefit which may be expected from the most nauseous *force* which nastiness can employ. If higher colour in cyder be desired than what his fruit naturally gives under the foregoing management, the cyderist will do well, he says, to melt a pound of lump-sugar in a stewpan, over a clear fire, stirring it frequently, until it comes to a very dark brown colour; then to take it off the fire, and, as it cools, add some cyder thereto by little and little, and continue stirring it until it becomes a thin uniform fluid. This colouring, in the quantity of about a pint, more or less as occasion may require, to a hogshhead, is very cheap and wholesome, tinges to perfection, gives no luscious sweetness, but rather an agreeable bitterness, and thus recommends itself to the nicer palates. Soon after this spring racking, but not till then, the casks may be gradually stopped, by first laying the cork on the bung-hole, and in a few days forcing it very tightly into it, covering it over with a layer of melted rosin, or other similar substance.

Bottling the Liquor.—This is the next business to be attended to in the management of cyder; and it is stated by the writer just mentioned, that in the month following, that which is named above, the cyder, in general, will be in a fit state for this operation; but that the critical time for this process is when the liquor has acquired in the cask its highest degree of perfection: then, when the weather is fair, the barometer high, and the wind in some northerly point, let the bottles be filled, setting them by uncorked until the morning; then let the corks be driven very tightly into the necks of the bottles, tied down with small strong twine or wire, and well secured with melted rosin, or other material of the same nature.

It is stated by Mr. Knight, that cyders which have been made from good fruits, and have been properly manufactured, will retain a considerable portion of sweetness, in the cask, to the end of three or four years; but that the saccharine part, on which alone their sweetness depends, gradually disappears, probably by a decomposition and discharge of fixed air, similar to that which takes place in the earlier stages of their fermentation. Cyder is generally in the best state to be put into the bottle at two years old, where it will soon become brisk and sparkling; and if it possesses much richness, it will remain with scarcely any sensible change during twenty or thirty years, or as long as the cork duly performs its office, or resists decay.

But in making cyder for the common use of the farmhouse, the same writer says, few of the foregoing rules are or ought to be attended to. The flavour of the liquor is here a secondary consideration with the farmer, whose first object must be to obtain a large quantity at a small expence. The common practice of the country is sufficiently well calculated to answer this purpose; the apples are usually gathered and ground as soon as they become moderately ripe; and the juice is either racked off at once, as soon as it becomes bright, or more frequently conveyed

from the prefs immediately to the cellar. A violent fermentation soon commences, and continues until nearly the whole of the saccharine part is decomposed. The casks are filled up and stopped early in the succeeding spring, and no further attention is either paid or required. The liquor thus prepared may be kept from two to five or six years in the cask, according to its strength. It is generally harsh and rough, but rarely acetous; and in this state, the writer believes, it is usually supposed to be preferred by the farmers and peasantry. When it has become extremely thin and harsh by excess of fermentation, the addition of a small quantity of bruised wheat, or slices of toasted bread, or any other farinaceous substance, will, he says, much diminish its disposition to become sour. But the above opinion is not, he thinks, well founded; they like it best when it possesses much strength with moderate richness, and when it is without anything harsh or sour in its flavour; but they will drink it, and to a most extraordinary excess, even when it is really in the acetous state.

And, as has been seen above, an inferior kind of liquor is made, the writer says, by macerating the reduced pulp, from which the cyder has been pressed, in a small quantity of water, and regrinding it. This may be kept till the next autumn, and usually supplies the place of cyder in the farm-house for all purposes, except for the labourers in the harvest. It is generally fit to drink very soon after it is made; and though no attention is ever paid to it during its fermentation, it often remains, till near the end of the succeeding summer, more palatable than the cyder pressed from the same fruit, which is a fortunate circumstance for the farmer.

In the business of making perry, which is a liquor of a somewhat similar nature, there is but little which is materially different in the process. See PERRY.

Produce and application of Cyder.—The produce of this liquor is a matter which is extremely difficult to ascertain, whether the quantity be taken by the acre, or in any other way. It has been stated by the author of the “Present State of Husbandry,” in this country, that the quantity of cyder and perry made for sale in the fruit districts is very great; but that, that used by the inhabitants is by various accounts much more considerable. These liquors are, he says, sold by the farmers in different states of preparation for market. Sometimes they are sold immediately from the prefs, sometimes after the first racking, and frequently, not until ready for use. The price of cyder and perry always advances according as these liquors are in a prepared state for the consumer’s use, as well as according to the quantity on hand, and the quality of the fruit whence it was made. Stire cyder and squash-perry, for instance, says he, always give much higher prices than what is made from any other sorts of fruit. The price of common cyder liquor from the prefs, for a course of seven years, may, he thinks, be rated at from 15s. to 30s. the hoghead of 110 gallons; and common perry from 12s. to 15s. Stire-cyder, in the same state, sells for 5l., 10l., and sometimes 15l. the hoghead; and squash perry, in ordinary seasons, from 4l. to 8l. the hoghead.

But the produce of cyder or perry by the acre can only, he says, be guessed at by first ascertaining the number of trees. From an orchard of trees, in full bearing, half a hoghead of cyder may, in seasons ordinarily favourable, he thinks, be expected from the fruit of each tree. As the number of trees on the acre varies from ten to forty, the quantity of cyder must vary in the same proportion; that is, from five to twenty hogheads. Pear trees, in equally good bearing, yield fully one-third more liquor; therefore, although the liquor extracted from pears sells at a lower price

than that produced from apples, yet the value by the acre, when the number of trees is the same, is nearly on a par.

Mr. Vancouver, in his Survey of the County of Devonshire, has remarked, that the great uncertainty of this sort of crops renders it a matter of great difficulty, to state any thing like an average produce of that district. He has found, however, that the mean, of several statements taken upon a period of seven years, which varied from two and a half to five hogheads per acre, will be found to equal that of three hogheads and two-fifths for the acre. And that the average price of the liquor at the *pond’s* mouth, or prefs, was, in 1807, fifty shillings the hoghead.

And the intelligent writer of the Report of the County of Gloucester, has offered a statement of the expence, produce, and profit of this kind of crop, in a different way on the extent of twenty acres.

Supposing the distance of planting the trees to be sixteen yards, the acre will admit sixteen stocks, which, with the original cost, planting, and fencing, may be estimated at 5s. each, or in the whole 4l.

Grafting, protecting, and keeping up fences till the trees are out of danger, may be stated at 2s. 6d. each.

It is suggested, that the return to the landlord will be very small for the first twenty years; and that he will not be able to put an additional rent on his lands, in less than thirty years, for the plantation.

The cost of erecting a cyder-house and mill stated at eighty pounds.

<i>General Estimate.</i>		£.	s.	d.
Planting 20 acres	-	80	0	0
Grafting, protecting, repairing, &c.	-	40	0	0
Interest for 30 years on 80l.	-	120	0	0
Building cyder-house, &c.	-	80	0	0
Total expence		320	0	0
		£.	s.	d.
Interest of 320l.	-	16	0	0
Profit	-	14	0	0
		30	0	0
Advance of rent on 20 acres	-	30	0	0

Consequently the landholder has the distant prospect, he says, of increasing his income 14l. per annum, or of receiving nearly 10 per cent. for money laid out, but subject to the deductions of repairs, &c.

But that, with the tenant the advantages are still less certain. Suppose the ground to be so well planted and grown as to contain sixteen trees capable of affording in a good season sixteen barrels, or 800 gallons of cyder, which is a large average allowance; and suppose the liquor to be sold from the mill at 4d. the gallon, the produce will be 13l. 6s. 8d. per acre, subject to the deductions of 20s. for tyres, 2l. for making, 10s. for gathering; in the whole 3l. 10s.: the remainder, 9l. 16s. 8d. will be clear profit; which, if it occurred every year, it would be considered highly beneficial; but a good crop rarely happens oftener than once in four years, while the damage done to the grafts under the trees is continued, as well as the increased parochial rates from the increased rent; it does not seem, therefore, the writer says, that the additional rent on account of the trees, is returned with much interest.

Though there are many individuals in the cyder districts who evince much care and attention in the management of their

their orchard-grounds, trees, fruit, liquor, &c.: Yet this is by no means, he says, the common case; on the contrary, such general negligence prevails, and so imperfect are the modes in which this branch of husbandry is for the most part conducted, that many are of opinion, so much valuable land being occupied as orchards, is, in a national view, extremely unprofitable; and that owing to the same causes, want of attention, and adopting improper modes of management, the farmers at large are also injured, rather than benefited. While, says he, orchards continue to be considered as secondary objects only of the farmer's attention, as is the case at present, it can hardly be expected that the produce will be abundant, or the quality such as to recommend it to more general notice. In place, however, of condemning orchard husbandry at large, it appears much more correct, he thinks, to recommend a general reform in the management; whereby liquors, that are both wholesome and agreeable, when well made, may be introduced into more general use, and so large an importation of foreign vinous liquors be rendered unnecessary. In place of planting only ten or a dozen of trees on the acre over an extensive tract of land, it would, he supposes, be more for the interest, and certainly much more convenient for the cydermen, were they to allot a few acres adjoining to their places of residence, for the sole purpose of growing fruit-trees. The loss and inconvenience of having fruit trees scattered over an arable field, are considerable. When the trees are full grown, they overshadow, and consequently greatly injure the crop below; the roots also spread to a great distance, and besides impeding the ploughing of the ground, extract a great share of the nourishment that would otherwise go to support the crop of corn. The additional expence in gathering and carrying home a crop of fruit from an extensive fruit-ground, beyond what is incurred when four trees stand on the same space of ground which in the other case is occupied by one, also merits attention. Inconveniences as great and numerous result from having fruit-trees thinly scattered over a pasture field. The grass under the shadow of the trees is very inferior to that in the open part of the field. The cattle must, says he, be excluded when the fruit-trees begin to ripen, especially during and immediately after high winds, otherwise they would eat the fruit. The falling of leaves in autumn is very destructive to pastures of all descriptions; and the same additional expence and trouble of gathering and carrying home the crop are also incurred. For these reasons, a close planted cyder-orchard must, he thinks, be preferable to fields; and where the soil and situation are proper, the grounds stocked with full-bearing trees of the best sorts; and when the trees, the fruit, and the liquor, are judiciously managed, it is impossible but, according to the produce and prices above-stated, such grounds must turn out profitable, even supposing they produce but one crop equal to that above-mentioned, every third year. On the other hand, if the slovenly manner of conducting the various operations of cyder-making be persisted in, it would be in favour of the nation, and of the individuals concerned in that branch of husbandry, he supposes, that there were not a cyder-orchard in the island. Perhaps, on another account also, it might be for the interest of the farmers in the fruit districts that orchards were abolished: the quantity of cyder annually used by the servants and labourers is so immense, that considering the injury which the crops of grain and grass sustain from the land's being incumbered with trees, the labour of collecting and carting home the fruit, and the trouble attending the

manufacturing it into liquors, this beverage must be a more serious article of expence than the generality of cyder farmers are disposed to allow.

It is, however, stated by Mr. Rudge, that where the management of these sorts of liquors is perfectly known and attended to, and there is a capital sufficient to prevent the necessity of immediate sale, as well as plenty of casks in the farmer's own cellar, he may be enabled to take the advantage of the most favourable circumstances of bringing it to the market, as when there is a scarcity from early sales, and no supplies expected from crops of succeeding years; when the price is frequently increased to 8*d.* or 1*s.* the gallon.

It is added, that old cyder is always valuable, and pays for keeping; which is suggested as the best means of countervailing the uncertainty of crops, though it oftener benefits the dealer than the grower of the fruit.

The same able writer also states, that farmers who live contiguous to canals or navigable rivers, have peculiar advantages from their situations, often turning long keeping fruits to a better account than grinding them for cyder, by sending them into the interior districts of the kingdom for the purpose of the table, at the price of 16*s.* per team: "for," says he, "supposing that eleven teams of nine pecks each, are required for 100 gallons, the cyder should be sold at 8*l.* 16*s.* to equalize the profit of their sale unground; but cyder, in its early state, seldom averages more than 9*d.* per gallon, which would be only 3*l.* 15*s.*; so that even supposing all the cyder to turn out well, the former method is far the more advantageous. It is therefore conceived, that in this way alone, the profits of a fruit estate can be satisfactorily made out in favour of the tenant of it. See ORCHARD, and APPLE-tree.

CYDER-Cask, in *Rural Economy*, a vessel of the barrel kind, made use of for the purpose of keeping the liquor. They are of various sizes or dimensions, according to the extent of the fruit grounds, and the fancy and circumstances of the farmer, in so far as capital is concerned. It is, however, commonly supposed that the strength of the liquor is better preserved, if not increased, by a large quantity or body of it being kept together. Though casks of this sort are made to hold from 400 to 500 gallons, the most general size is 110 gallons, which is alone employed in sending out the cyder for sale. The usual price of this kind of casks is about five-pence the gallon.

It is observed that the choice of proper vessels for keeping the liquor in after it has been fermented, is a very material point to be regarded, as none is so liable as this to take the taste or twang of the cask: new vessels, though the wood be ever so well seasoned, are apt to give a disagreeable relish to all liquors, and remarkably so to cyder, unless due caution be used beforehand. Frequent scalding with hot water, into which some handfuls of salt have been first thrown, or with water in which some of the pommage has been boiled, and washing afterwards with cyder, are the usual remedies against this evil, and seldom fail of removing it effectually. Of all sorts of old casks, beer vessels are the worst, as they always spoil cyder; and in return cyder casks infallibly spoil beer. Wine and brandy casks do very well, provided the tartar adhering to their sides be carefully scraped off, and they are well scalded. These different circumstances should always be carefully attended to, in cleaning and preparing casks of this kind for the reception of the liquor.

CYDER-Cloths, are such cloths as are manufactured for the purpose of the cyder-maker, being made use of for

C Y D E R.

containing the pommage, in order to its undergoing the operation of the prefs. They are usually formed of common hair-cloth, but which is of the more close and compact nature or texture.

The size is generally about four feet square; and they hold about two or three bushels, or as much as the mill can grind at once; and these are, as has been seen, heaped over each other until the prefs is full, being kept to an uniform size by a wooden frame or gauge. The larger presses are capable of holding from eight to fifteen bags or cloths, which yield from one to two hundred gallons of liquor, according to the largeness of what is termed the *cheefe*. To perform the work neatly, it is necessary to have two sets of these cloths or bags, as they are apt to clog and fur in pressing, and consequently become unfit for use again till they have been washed and dried; so that while this is doing, either the prefs must stand still, or another set be ready to employ it. But some, instead of cloths or hair-bags, lay dry straw under the pommage, the ends of which they turn up over it; then cover the pommage entirely with fresh clean sweet-smelling straw, upon which they spread another layer of pommage; and so on alternately, until the prefs is full. Either of the methods will answer the purpose; but those who are desirous of doing the work in the neatest and best manner, generally use hair bags or cloths in performing the business. See CYDER.

CYDER-Kin, an inferior sort of fruit liquor, which is made after the better kind has been prepared, in the manner which has been noticed in speaking of cyder. (See CYDER.) It is mostly used for domestic purposes.

CYDER-Mill is that sort of machine or contrivance, which is constructed for the purpose of crushing, grinding, and reducing apples, or other similar fruits, into the state of a fine pulp or pommage, in order that the juice or liquor may be drawn from it, by means of pressure. In different districts there are variations in the manner of constructing these mills; but they chiefly consist of two kinds, the horse and the hand mills; the former being principally in use where the extent of fruit ground is considerable, but the latter mostly where the farms of this kind are small, and insufficient to repay the expence of such large machinery.

The first sort, or *horse-mill*, which is that by much the most generally met with, is commonly constructed somewhat on the same principles as those in use for the purpose of grinding bark for the tanners, and consists of the following distinct parts, namely, the cistern-chase, or trough, the runner or bruising-stone, and the cog-wheel and upright axle-tree, with the stirrer, the reever, and the shovel employed in the process.

It is stated by Mr. Rudge, in his "Agricultural Survey of Gloucestershire," that the cistern is circular, and formed of stone, being hollowed out in such a manner as to fit and receive the runner, commonly to the depth of about nine inches. On the inner side, or that which is next, what is usually termed the "nut" or central space, it is cut out in a perpendicular form, but on the exterior or outside somewhat in a sloping direction, being left wider across at the top than at the bottom; and the outside upper edge is left two or three inches in width, in order to receive what is denominated a "curbing," which is made of wood, and raises it four inches higher, being finished with nearly a sharp edge. The design of this wood-work is not merely to prevent the pulp or pommage from being carried over, as the stone rolls or turns round, but likewise to correspond with a four-inch plank or planks, which cover the nut, or

circular vacant space in the centre. It is usual for the cisterns to be delivered from the quarries in three or four separate parts, which are afterwards fitted and cramped together by the mill-wright. A cistern of thirty feet in circumference will be requisite for a mill of the ordinary size; and the price is regulated by the number of gallons which it is capable of containing, or at the rate of one guinea the foot in diameter.

In regard to the runner or bruising stone, it is seldom less than three feet and a half, or more than four feet in diameter, being made perfectly flat on the side next the nut, but a little convex on the other, nearly fitting the bottom of the cistern. In the middle, a strong axle of wood is fastened through it, which is connected with an upright or standard axle-tree in the centre, which extends sufficiently far from the exterior side of the runner to connect by means of an iron rod with a wooden bar, which is also linked to the upright axle, and to which the horse is fastened. This wooden bar or pole is so fixed as to be before the runner, and keep the horse clear of it. The height is regulated by a substructure of stone work under the cistern or chase.

To the horizontal axle is fitted a cog-wheel of from eighteen inches to two feet in diameter, which runs on the wood-work that covers the whole space; from the interior edge of the cistern to the perpendicular axle, and which is denominated the nut. The exact height of this wheel must consequently be determined by that of the centre of the runner above the nut. The cogs of this wheel catch upon upright teeth, fixed in the nut, as it rolls upon the surface, and by this means force the stone into a rotatory motion, which under other circumstances it would not always keep; as when the apples are first introduced, or when the bottom of the cistern has become smooth from the pulp, it might slide along rather than roll, was it not for some machinery of this nature; though some mills are without it notwithstanding.

The perpendicular axle-tree has an iron pin at each end as pivots, which runs in a sunk iron centre; the wood of the axle, which is bound with an iron ring or hoop, forming the shoulder of it.

The runner, or stone for grinding, is commonly sold at the quarry at the rate of one guinea the foot, or as many guineas as the stone measures feet in diameter; being, in the district mentioned above, procured from the forest of Dean. They are a sort of dark reddish kind of grit stone, not calcareous, but of sufficient hardness.

It is suggested by Mr. Marshall that much depends upon the quality of the stone. It should not be calcareous, either in the whole or any part, as the acid of the liquor would, in that case, corrode and decompose it. Some of the stones in Herefordshire have, he says, calcareous pebbles in them, which being dissolved as above, of course leave holes in them. Nor should the stone be of such a kind as to communicate a disagreeable tinge to the liquor.

The same writer remarks likewise that there are some mills of this kind which have two runners, one opposite the other. And he thinks that the situation of these mills should be such as to have a horse-path, of about three feet in width, between the bed and the walls; consequently, a moderate sized mill, with its horse-path, takes up a space of fourteen or fifteen feet in every direction.

At Fig. 1. in Plate XI. on *Agriculture*, an improved mill of this sort is represented, in which A is the runner or stone, B C D the cistern-chase or trough, in which the
stone

stone moves and reduces the apples; EFG the horse-path; and HI the manner in which the moving power is attached.

The other appendages of the cyder-mill noticed above may be thus described:

The *stirrer* consists of a strong round stick, with which the fruit is constantly kept to the stone, and removed from the sides to the bottom, during the process of grinding; for which purpose, a woman or boy usually walks either before or behind the horse. Some horse-mills have two stirrers, so attached to the axle-tree of the runner as to execute the work effectually without manual assistance.

The *reever* is a small piece of board securely fastened to a wooden handle, and so formed as to fit the shape of the cistern; by means of which, when the pommage or pulp is sufficiently ground, it is drawn together in order to be conveyed to the prefs by the shovel.

The *shovel* is a tool somewhat of the spade kind, mostly made of wood, being a sort of scoop, by which the above operation is readily performed. Iron shovels are, however, sometimes made use of; but a portion of the iron is supposed to be dissolved by the acid of the liquor, which may possibly contribute to the black tinge frequently noticed in cyder, after exposure to the air. Wooden implements should therefore, of course, be preferred, as being more cleanly, and, at the same time, free from this sort of danger.

The second sort, or *hand cyder-mill*, is constituted of two toothed or indented wooden cylinders of about nine inches in diameter, each being inclosed in the manner of other mills, having a feeder at the top, and being made so as to be turned by the hand. By this sort of mill, the work of bruising the rind, kernel, and stalk, as well as that of reducing the fleshy parts to a perfect pulp, is well performed. From the circumstance of the cylinders being so arranged as to be capable of being removed to a greater or less distance from each other, the business advances in a regular progressive manner, from the first cutting of the fruit until the cylinders are brought so close together that a kernel cannot pass without being bruised; and where another pair of finer toothed cylinders are had recourse to, to work under these, so as to bring the pulp into a perfect state of fineness, the business is still more effectually executed. But though by this means much time is saved, more strength is required in the operation. It is with difficulty that the same degree of fineness can be effected by the horse-mill, as in spite of the incessant attention of the labourer who has the care of stirring the fruit while under the operation of grinding, and of keeping it to the runner, a large portion is conveyed to the prefs without having been fully reduced. A mill of this description is shown at *fig. 2.* in the same plate.

It is observed by the intelligent author of the Report noticed above, that "two disadvantages attach to the hand-mill in its present state, loss of time and increase of manual labour;" it being "difficult, with the assistance of three men, to grind a hoghead in a day;" while "with a horse-mill, from two to three hogheads may be made by a man and woman, or younger person, and one horse;" consequently, its superiority on a large fruit farm is conceived to be decided. It is, however, added, that the hand-mill is capable of being greatly improved in the point of expedition, by the attachment of a large horizontal wheel and horse, as has been done in some manufactories.

It has been remarked by the author of the Rural Economy of Gloucestershire, that from observing the great simplicity and high degree of perfection with which the sugar

mills grind the canes or rather prefs out their juice between two plain iron rollers, the imperfections of cyder-mills appear more striking. It is however noticed that the sugar cane is a long fibrous body; and readily passes through between the rollers: whereas fruit being globular, and of a cellular substance, is not easily laid hold of, or, if caught, has no lengthened fibres to induce it to pass, like the cane, between plain rollers. It has, however, been found, that between fluted rollers it may be made to pass; and in consequence, these rollers are in use, though not common. They are of cast iron, hollow, about nine inches diameter, with flutes or teeth, about an inch wide, and nearly as much deep. In general they are worked by hand, two men working against each other. Between these the fruit passes twice: the rollers being first set wide, to break it into fragments, and afterwards closer, to reduce the fragments. But even this is not, he says, a perfect engine: in the residuum from the prefs many kernels are found. Besides, the acid of the fruit is liable to corrode the iron, and this, in return, to tinge the liquor, though neither of these inconveniences is acknowledged. In a country, however, where stone is not easily to be had, this may, perhaps, be found the most eligible cyder-mill. But in this district, where stone is sufficiently plentiful, the stone runner and trough seem to be the most eligible mill at present known: though it appears to him highly probable, that, with attention and perseverance, a more perfect machine might be invented. Be this, says the writer, as it may, the present mill appears to be capable of improvement. It is at present an unfinished machine: he means when it is first turned out of the workman's hands: time and constant wear do that, in part at least, which the workman leaves undone. The acting parts of the machine, those which are to bruise the rind, and crush the kernels, are the face of the roller and the bottom of the trough. But instead of their being adapted to each other, in such a manner as to effect these purposes with a degree of certainty, they are left in such rough unfinished state as in a great measure prevents them, during the first fifty years at least, from performing that which is their principal intention. Instead of being worked over, and fitted nicely to each other, with the square and chisel, they are hewn over with the stone-mason's peck only, leaving holes and protuberances which would have even horse-beans from the pressure, much more the kernels of fruit. A runner which has been worn two and twenty years has often holes left in it which would lodge half a dozen kernels with safety. To account for this absurdity seems, he says, impossible: perhaps the roughness was intended to prevent the runner from sliding; but the use of the cogged wheels has superseded this intention. Perhaps it was left to gather up the fruits with greater effect; but surely, deep chisel marks, left in the form of flutes across the face, would have answered this purpose better, and would perhaps have laid hold of and fixed the kernels, so as to serve their being effectually broken, preferable to any other equally simple expedient. Or, perhaps, the custom was established when the uses of the rind and kernel were not known, and time has not yet corrected the error. He has been told, that the roughness is left to cut the fruit the better on its being first put into the trough: and that on this ingenious principle, some will pick their runners over as often as they wear smooth. To such cyder-makers, he would recommend the horse-mill, which would come much cheaper, and work still faster, and save the expence of pecking. Be the origin of folly what it may, says he, it is painful to observe its effect. In this case, however, the folly, and, of course, its effect may be easily removed. Having made the face of the roller as true as the square

and the chissel can render it, work, says he, the bottom of the trough to it, until not a mustard-seed can escape them. The kernels of fruit are hard, slippery, and singularly difficult to fix, escaping pressure in a peculiar manner; and with singular alertness.

It is remarked in addition, that another improvement of the common cyder-mill appears to be much wanted; namely, a method of preventing the materials in the last stage of grinding from rising before the runner; and further, a more mechanical way of stirring up and adjusting them in the chafe. Until these improvements be made, cyder-mills, says he, must remain, what most of them evidently are at present, imperfect machines.

It has been noticed by the same writer, that a mill-house, on an orchard farm, is as necessary as a barn on those of other kinds. It is in general found to be one end of an out-building, or frequently an open shed, under which straw or small implements are laid up when not in use. The smallest dimensions possible to render it in any degree convenient and useful are, he thinks, twenty-four feet by twenty; having a floor thrown over it at the height of seven feet; and a door in the middle of the front with a window opposite; the mill being fixed up on one side of it, and the press on the other; as much room as is possible being left towards the door, in the front part, for the reception of fruit and the different necessary utensils.

Mr. Rudge considers the "arrangement of the buildings for the convenience of making and storing fruit liquors as a matter of great importance," though it seems to have been but little attended to on old farms. The mill and press being often found in an insulated building at a distance from the cellars; which occasions the employing of a man and boy, with a horse and dray to convey the liquor to the place where it is to be casked, which is a labour that would be unnecessary were the mill-house and cellars attached. In some of the more recent erections of this description, the spout of the vat is so contrived as to discharge the liquor through an opening in the wall, into a receiver in the cellar, from which it is distributed with facility to the different casks which are to be filled.

The rest of the utensils belonging to a mill-house are few: the fruit being simply brought in casks or large baskets, and the liquor carried out in pails, or by means of spouts as noticed above. The hair-cloths, mentioned above, are the principal addition to the mill and press. The expence of fitting up a cyder-mill house depends, Mr. Marshall says, on the size and quality of the mill and press. One of a moderate size, for a farm, may be furnished completely for from twenty to twenty-five pounds. One on a small scale might be furnished for from ten to fifteen pounds: much depending on the distance of carriage of the stone. This expence is usually borne by the landlord. A mill-house substantially fitted up will last many years. He has observed a mill and press which, by the date upon them, have been set up more than twenty years, yet they appeared almost as fresh as new. Many of the old mills and presses, which are seen, may, compared with those, seem to be a century old; or the mills more particularly a greater age, and were probably the original mills of the farms they are upon.

These observations shew that considerable attention should be bestowed by the fruit farmer in fitting up and completing his buildings and machinery for the management of this sort of liquor.

CYDER-PRESS, a machine of the press kind, contrived for the purpose of forcing the juice from different sorts of fruits after their substance has been reduced to the state

of pulp by means of grinding. They are mostly constructed on the same principles as those of other kinds which are intended to afford a strong or powerful pressure, as the packing and oil-press.

It is constituted, according to Mr. Rudge, of the following parts, a cistern-still, vat, cheeks, or "sifters," cap and screw, lanthorn, bridge, press-blocks, shooter, lever, windlas, and rope.

The cheeks, or sifters, are two strong upright pieces of oak, which are preserved in their situations, by being let into the ground first, and then by the cistern-still, which is a thick piece of timber, extending from one cheek to the other, near to the ground, being open mortised at each end, resting upon a shoulder, and clipping the upright: through these open mortises, and the upright, a strong iron pin is passed, which prevents the cheeks from spreading or giving way in the operation of pressing. A corresponding piece is fixed near the top, which is mortised and fastened in the same manner to the cheeks, through the centre of which the female screw or nut is made, in that case denominated the cap.

What is termed the vat, is a wide plank, with a groove running round it near the edge, or what is preferable, a raised levelled border coinciding with the edge, about an inch in thickness, to prevent the liquor from running off at the sides, and conduct it to the sluice or spout from which it is discharged into the receiver. This vat is firmly fixed on the cistern-still.

The screw, when made of wood, is mostly nine or ten inches in diameter, and which passing through the cap, rises three or four feet to the lower end, which is square; the bridge is hung, by means of a rounded pin, which is a plank reaching from one cheek to the other, being freely moveable up and down, but kept to a regular situation or position by open mortises. The lower end of the screw is left of a larger diameter, when the lever is intended to work in it, being in this case perforated and hooped with iron, but the lanthorn is more frequently fixed upon it. This is made of two circular pieces of wood, less than two feet in diameter, being kept eight inches apart by ten strong pillars, between which a piece of ash or elm timber is occasionally placed, which is termed the lever. There are two of these belonging to the press, being used according to the extent of power required, one being shorter and less strong than the other, being capable of being worked by the strength of one man, during the commencement of the pressing; but as the liquor becomes more expressed and when nearly exhausted, another lever of greater length and strength is applied to the lanthorn, and worked by means of the windlas, which is an upright post, turning with an iron pivot in a socket on the ground, and passing through a beam in a rather free manner at the top, being removeable when not wanted. A rope coiled round this windlas, is hung by a loop to the end of the lever, being there secured from springing off, by a wooden pin. The windlas has likewise at proper heights, from two to four bars of wood passing through for the purpose of handles, to which the strength of four men may be applied with much effect. The press-blocks are pieces of oak, about two feet in length, and six inches square, placed one above the other, crossing in alternate pairs, under the bridge, for the purpose of keeping the lanthorn, lever, and rope above the heads of the workmen at the windlas.

It is suggested that iron screws have of late been coming much into use, being either cast or wrought; the price of the former being about 2*l.* 15*s.*; and of the latter nearly 10*l.* The power is supposed by some to be increased by the

the fineness of the threads in the iron screw, while others admit of no other superiority but that of durability.

The price of a good press with wooden screw is usually about ten guineas.

It has been suggested by the author of the Rural Economy of Gloucestershire that the situation of the press should be as near the horse path of the mill as conveniency and the nature of the building will permit, in order to the more ready conveyance of the ground pommage or pulp from the mill to it. The size of the cyder-press may be different according to the extent of the apple orchard.

An improved *Large Cyder-press* is shewn at *fig. 3*, in which A A is the base or foundation with its supporting parts: B, B, the cheeks or filters: D D the cross piece at top, through which the screw passes, and which consequently contains the nut or female screw: E the screw with its appendages: F F the bridge or cross piece which acts on the pommage: G G is the wide plank or vat on which the pulp rests in the hair bags; in which the mode of the liquor's passing off is seen: H H (*fig. 4.*) is the windlass, with its handles, wheel, rope, &c.

At *fig. 5*, is seen a small *Cyder-press* of a different kind, which acts by means of a heavy stone or block of wood made of a conical form, moving round the centre by a lever which is inserted into its base, as shewn at A and B: C is the bed of the press, notched for letting off the liquor into the cask or vessel, D, placed below: E, E, E, are the feet or blocks on which the whole rests.

CYDER-SPIRIT, a spirituous liquor drawn from *cyder* by distillation, in the same manner as brandy from wine. The particular flavour of this spirit is not the most agreeable, but it may, with care, be divested wholly of it, and rendered a perfectly pure and insipid spirit, upon rectification. The traders in spirituous liquors are well enough acquainted with the value of such a spirit as this: they can give it the flavours of some other kinds, and sell it under their names, or mix it in large proportion with the foreign brandy, rum, and arack, in the sale, without danger of a discovery of the cheat.

CYDER-VAT, is a term applied to that part of the cyder-press which first receives the liquor as it is forced out from the pulp, and by which it is conveyed into the receiver. See *CYDER-PRESS*.

It is likewise a name often given to the vessels which receive the cyder before it is racked off into the store casks.

It is remarked in the Survey of the County of Gloucester, that the vat is still, in some cases, covered with lead, although the pernicious effects of its being corroded by the acid of the liquor have been frequently experienced. It should on this account be always made of some sort of hard wood.

CYDER-VINEGAR. See *VINEGAR*.

CYDER-WINE, is the name of a sort of family wine made by concentrating the juice or liquor of apples, by evaporating it to nearly one half, and afterwards, when it becomes cold, fermenting it, in a suitable cask in the usual way. By this means a very pleasant and cooling wine is said to be prepared.

CYDISES MOUNTAINS, in *Ancient Geography*, a mountain of Asia, towards Armenia. Strabo.

CYDNA, a town of Macedonia, the same with *Pydna*.

CYDNUS. See *CIDNUS*.

CYDNUS, a river of Asia Minor, in Bithynia.

CYDOESSA, a fortified village of Phœnicia, at a small distance from the sea, which belonged to the Tyrians.

CYDONEA, an island of the Mediterranean sea;

opposite to that of Lesbos; one of the five islands comprehended under the denomination of *Leuce*.

CYDONIA, in *Botany*. Tournefort. Juss. Vent. See *PYRUS Cydonia*.

CYDONIA, or *CYDONIS*, in *Ancient Geography*, *la Canée*, the most ancient city in the island of Crete, said to have been built by Minos, and enlarged by the Samians. It stood according to Strabo, Pliny, and Diodorus Siculus, on the coast opposite to the Laedæmonian territory in the Peloponnesus, and it was the most powerful and wealthy city of the whole island; since in the civil wars it withstood the united forces of Gnoffus and Gortyna, after they had reduced the greater part of the island. Its strength was such that, though it was often besieged; it was never taken till the time of Metellus, to whom its gates were opened after the defeat of Lathenes and Panares. On account of its antiquity, it was called by the Greeks "the mother of cities." From Cydonia the quince-tree was first brought into Italy, and thence the fruit was called *malum Cydonium*, or *Cydonian apple*.

CYDONIS, or *ACYDONIS*, a river of Greece, in the Peloponnesus. Strabo.

CYDONITES VINUM. See *VINUM*.

CYDRANA, in *Ancient Geography*, a town of Asia Minor, situated on the confines of Phrygia and Lydia; W. of Colossæ, S. of the Meander.

CYDRIÆ, a town placed by Strabo on the frontiers of Epirus and Macedonia, belonging to a people, called *Byrsi*.

CYDRUS, or *CYDRINA*, a town of Asia, in Armenia. Steph. Byz.

CYENIUM, a place of Ethiopia, which, according to Arrian, was situated between the Nile, and the town of Adule.

CYGNUS, or *CYGNUM*, a town built by the Greeks at the lower part of the Euxine sea, near the banks of the Phasis.—Also, another town in the same country at a great distance from the Phasis. Pliny.

CYGNUS, or *Cygnus*, *Gallina*, the *SWAN*, in *Astronomy*, a constellation of the northern hemisphere, between *Lyra* and *Cepheus*. See *CONSTELLATION*.

The stars in the constellation *Cygnus*, in Ptolemy's Catalogue, are 19; in Tycho's, 18; in Hevelius's, 47; in the Britannic Catalogue, 81. For an account of the variable stars in this constellation by Edward Pigott, esq. see *Phil. Mag.* vol. lxxvi. p. 198, &c. For observations on the comparative lustre of its stars by Dr. Herschel, see *Phil. Trans.* vol. lxxxvi. p. 201. 217. vol. lxxxvii. p. 307.

CYGNUS, *swan*, in *Ornithology*, a species of *ANAS*, which see. See also *SWAN*.

CYGNUS cucullatus, the *hooded swan*, a name very improperly given by some authors to the *dodo*, a very large bird, rather approaching to the cassowary kind, but not so long legged, or long necked. Ray. See *DIDUS Neptus*.

CYIZA PORTUS, in *Ancient Geography*, a sea-port on the coast of Carmania, between the promontories *Bagia* and *Alabater*.

CYLANDUS, an ancient town of Asia Minor, in *Caria*. Steph. Byz.

CYLARABIS, a place in the Peloponnesus, in *Laconia*, about 300 paces from Sparta, where the youth exercised.

CYLICES, a people of Illyria, according to Athenæus, called by others, *Enchelæ*.

CYLICRANI, a people of Greece, in the Phthiotide territory, between the *Sperchius* and *Asopus*. Ortelius, says that they were the inhabitants of the town of *Heraclæa*, situated at the foot of Mount *Cæta*.

CYLINDER. If a right-angled parallelogram be made

CYLINDER.

made to revolve about one of its sides which remains fixed, the solid figure thus described is called a cylinder. The axis of the cylinder is that side of the parallelogram which remains fixed. This solid is terminated by three surfaces: a convex surface, and two plane circles, which are the ends, or bases, of the cylinder.

The above is Euclid's definition (Def. 21. 11. E.): it may be rendered more general. Let there be a plane circle, and a right line drawn from the centre, whether perpendicular, or inclined in any manner to the plane of the circle; and let another right line, indefinitely produced, be carried completely round in the periphery of the circle so as to be always parallel to the right line drawn from the centre; thus the surface described by the revolving line is called a cylindrical surface, of which the plane circle is the base, and the line drawn from the centre the axis. A cylinder may now be defined to be a solid figure bounded by a cylindrical surface, and two plane circles equal and parallel to the base of the cylindrical surface. This definition will coincide with Euclid's, when the axis of the cylindrical surface is perpendicular to the plane of the base. In this case the solid is called a right cylinder; in all other cases it is called an oblique cylinder.

From these definitions the following consequences may be described in a manner too obvious to require to be formally demonstrated. If a plane, parallel to another plane, drawn through the axis of a cylinder, cut the plane of the base of the cylinder in a right line that is a tangent of the base; that plane will touch the cylindrical surface, and will meet it in a right line parallel to the axis: but if such a plane cut the plane of the base in a right line that passes within the base, it will cut the cylindrical surface in two parallel right lines, and the common section of the plane and cylinder will be a parallelogram. And, again, the common section of a cylindrical surface, and a plane parallel to the base, is a circle having its centre in the axis.

Let us now consider the section of a cylinder by any other plane. Suppose a plane (*Plate IV. Geometry, fig. 3.*) to cut a cylinder in the common section PQ: let the cutting plane produced meet the plane of the base in the line MN, and from E, the centre of the base, draw the diameter CD, perpendicular to MN, and let a plane drawn through CD, and the axis of the cylinder, EF, meet the cutting plane, in the line PQR, and the cylinder in the parallelogram ABCD: let the axis of the cylinder, EF, meet the line PQO in, (which is plainly the middle of PQ), and through O, and any other point of PQ, as I, draw GH and ST parallel to MN: let a plane, STZX, be drawn through ST parallel to the plane, GHJK, that passes through GH, and the axis EF; because GH is parallel to MN, the common section of any two planes drawn through these lines will be parallel to both of them: therefore, KL is parallel to GH: and in like manner XZ is shewn to be parallel to ST and MN. Therefore the figures, GHJK, STZX, are parallelograms; and GH = KL = CD, also ST = XZ. Because XZ is parallel to MN, it is perpendicular to CD, and consequently it is bisected by CD: hence it is plain that ST is bisected by PQ. Now

$$PQ : CD, \text{ or } GH :: PI : CY$$

$$PQ : CD, \text{ or } GH :: IQ : DY$$

Therefore, because $CY \times YD = XY^2 = SI^2$,

$$PQ^2 : GH^2 :: PI \times IQ : SI^2$$

Therefore the section is, in general, an ellipse, of which PQ and GH are two conjugate diameters.

Two conditions are necessary to make the section PQ a circle: the conjugate diameters PQ and GH must be equal; and they must cut one another at right angles.

The first of these conditions will take place when the triangle, ROE, is isosceles, or when the line, PQ, is so inclined to the axis of the cylinder, as to make the angle FOP = the angle AFO, and the angle POE = CEO. The second condition requires that GH be perpendicular to PQ, or MN perpendicular to FR; which cannot be the case unless the plane, ΔPCD , be perpendicular to the ends of the cylinder as well as to the plane of the section PQ. Hence, then, we are to conclude that, if a cylinder be cut through the axis, by a plane, ABCD, perpendicular to the two ends, and likewise by another plane, PQ, perpendicular to the former, in such a manner that the second plane, PQ, is equally inclined to the axis of the cylinder as the two ends, but in a contrary position; the section of the cylinder by the second plane will be a circle equal to the ends of the cylinder. Such a section of a cylinder is usually called a subcontrary section. In a right cylinder the section parallel to the base, and the subcontrary section, are confounded together, and make only one section. Every other section of a cylinder, excepting those mentioned, is an ellipse.

The solidity of a figure, of which all the parallel sections are equal, such as a prism or cylinder, is measured by the product of the surface of one section by the perpendicular distance of the extreme sections. Hence all cylinders are equal in solid content, that stand on equal bases, and have equal perpendicular heights, however they may differ from one another in degrees of obliquity. If a cone and cylinder have equal bases and equal perpendicular heights, the solidity of the former will be one-third part of the solidity of the latter. Euclid has demonstrated this proposition in the case of the right cone and cylinder (10. 12. E.), and the same demonstration will equally apply when the solids are oblique.

The convex surface of a right cylinder is measured by the product of the altitude multiplied by the periphery of the base. If a rectangle be constructed, having its length equal to the altitude of a right cylinder and its breadth equal to the periphery of its base; it is plain that such a rectangle, being lapped round the convex surface of the cylinder, will completely cover it. From this we may derive the solution of the problem (*fig. 4.*) which requires to trace the line of shortest distance between two points (as A and B) on the surface of a right cylinder. Through one of the points, as A, draw a plane, MAN, parallel to the ends of the cylinder, and through the other point, B, draw BG in the cylindrical surface parallel to the axis, EF: take $cd, cd, \&c.$, in the same surface, parallel to BG, and of such lengths that they may bear to the arcs, $cA, cA, \&c.$ the same proportion that BG bears to the arc GA: then will the points, $d, d, \&c.$ mark out the line of shortest distance between A and B. For if the surface of the cylinder be rolled off into a plane, the arcs AG, $Ac, Ac, \&c.$ as well as the lines BG, $cd, cd, \&c.$ will be right lines, and therefore the points, $d, d, \&c.$ will be in the right line between A B, which is the shortest distance between these points.

If an oblique cylinder be cut by a plane perpendicular to the axis, then, according to what has already been shewn, the section will be an ellipse, the periphery of which will be at right angles to all the right lines drawn in the surface of the cylinder parallel to the axis; and because these right lines are all of the same length, equal to the axis, it readily follows that the convex surface of the cylinder is measured by the product of the axis into the periphery of the ellipse.

It is demonstrated in mechanics, that the solidity of a cylinder

cylinder is the factum of the generating rectangle ABCD, *Plate IV. Geometry, fig. 5.*) into the periphery of the circle described by the radius E G, which is subtiple of E F, or the semidiameter of the cylinder. See CENTRO-BARYC method.

CYLINDERS, for the ratio of. As all cylinders, cones, &c. are in a ratio composed of their bases and altitude: hence, if their bases be equal, they will be in the ratio of their heights; if their altitudes be equal, in the ratio of their bases.

Hence, also, the bases of cylinders and cones being circles; and circles being in a duplicate ratio of their diameters; all cylinders and cones are in a ratio compounded of the direct ratio of the altitude, and the duplicate one of their diameters: and, if they be equally high, as the squares of the diameters.

Hence, again, if in cylinders the altitude be equal to the diameter of the bases, they will be in a triplicate ratio of the diameters of the base. All cylinders, cones, &c. are in a triplicate ratio of their homologous sides; as also of their altitudes.

Again, equal cylinders, cones, &c. reciprocate their base and altitudes. See CONE, &c.

Lastly, a cylinder, whose altitude is equal to the diameter of the base, is to the cube of its diameter, as 785 to 1000.

To find a circle equal to the surface of a given cylinder, we have this theorem: the surface of a cylinder is equal to a circle, whose radius is a mean proportional between the diameter and height of the cylinder.

The diameter of a sphere, and altitude of a cylinder equal thereto, being given, to find the diameter of the cylinder: the theorem is, the square of the diameter of the sphere is to the square of the diameter of the cylinder equal to it, nearly, as triple the altitude of the cylinder to double the diameter of the sphere. See SPHERE.

To find a rete, or cage, whence a cylinder may be formed, or where-with any cylinder may be covered. With the diameter of the base describe two circles; find their peripheries: and, upon a line equal to the altitude of the cylinder, form a rectangle, whose other dimension is equal to the found periphery. Thus may the cylinder required be formed, or covered.

When the cylinder is oblique, the estimate of its superficies depends upon the rectification of the ellipse; for a plane cutting the cylinder at right angles to the axis will produce an ellipse, and the superficies will be equal to the product of this elliptic periphery by the side of the cylinder.

CYLINDER, resistance of a. See RESISTANCE.

CYLINDER, scenography of a. See SCENOGRAPHY.

CYLINDER, in Zoology, the VOLUTA *Oliva*; which see.

CYLINDER, concave, of a gun is the inward cavity or bore of the gun, which receives the powder and shot. See CANNON.

CYLINDER, charged, is the chamber and that part of the concave cylinder, which is filled or occupied by the powder and ball. See CANNON.

CYLINDER, vacant, is that part of the bore which remains empty after the gun or other piece of ordnance is loaded.

CYLINDER, rolling, in Mechanics, a cylinder which rolls up an inclined plane.

The phenomena of the rolling cylinder may be easily accounted for from what we have observed under centre of gravity.

For let ABED (*Plate XXII. Mechanics, fig. 1.*) repre-

sent the section of a cylinder of wood, biased on one side by a cylindrical piece of lead, as B, which will bring the centre of gravity out of the centre of magnitude, C, to some point, G, between C and B. Let F H be an inclined plane, whose base is F L. It is evident the cylinder laid upon the plane will no where rest but there, where a perpendicular to the horizon, F L, passes through the centre of gravity G, and that point of the plane E, in which the cylinder touches it; and this, in all angles of inclination of the plane less than that whose sine is equal to C G, the radius being C D, will be in two situations ABED, and abed: because when the cylinder moves, the centre of gravity describing a circle round the centre of magnitude C, this circle will meet the perpendicular in two points G and g, in each of which the centre of gravity being supposed, the cylinder will rest. Therefore the cylinder moves from E to e by the descent of the centre of gravity from G to g, in the arc of the cycloid G l g.

If the cylinder ABED, *fig. 2.* insiding on the horizontal line E L, in the point E, has the centre of gravity G in the horizontal diameter D B, it will gravitate in the perpendicular G: if therefore the plane F H touch the cylinder in the point e, it is evident the cylinder cannot either ascend or descend on such a plane. Because G in any situation between e and H, or e and F, will gravitate to the left or right from the point in which the cylinder touches the plane; and so will in either case bring it back to the point e. And as the angle E C e is equal to H F L, it follows, that a cylinder cannot ascend on a plane whose inclination is greater than that angle.

CYLINDER-Boring, is the method of boring out and smoothing cylinders of brass, iron, or other metals, for pump-barrels, steam-engines, &c. &c.

Plate XXIII. Mechanics, is appropriated to the description of a machine for this purpose, designed by Mr. John Dixon, Maid-lane, Southwark, and erected by him at the Falcon iron-foundery.

Fig. 1. is an elevation of the machine, in the operation of boring a cylinder for a steam-engine. *Fig. 2.* is a plan. *Figs. 3, 4, 5,* parts of the machine. *Fig. 6.* an end elevation. *Fig. 7.* a section.

The machine is turned by a steam-engine, which communicates motion by means of a coupling-box, a, to a long iron shaft A B, turning in brass bearings, supported on iron standards C, D, bolted to the two ground hills E, F; this shaft (called the boring bar) is perforated from end to end, as is shewn in the section, *fig. 3,* and has also a slit, b b, *fig. 1,* through it nearly its whole length; it is turned in a lathe, and thus made a perfect cylinder. Another short cylinder, D D (in the section, *figs. 3.* and *fig. 5.*), slides easily upon the boring bar without shake, and is made to turn round with the bar, by two short iron bars, d, d, which pass through the slit, b b, made in the boring bar, and fit in their ends into two notches made in the ends of the short cylinder D D. E is a long screw going with in the boring bar, and of the same length; the end which enters the boring bar, and which is not cut into a thread for some length, passes through holes made in the middle of the short bar d, d, and is held in by wedges, as in *fig. 3.*

The knife or cutters, c, c, *fig. 1,* are fixed in wedges which touch round the circumference of a cast-iron ring, *fig. 4,* called the cutter block; the inner circle, *fig. 5,* is of the same line as the outside of D D, upon which *fig. 6,* *plate 3,* and made to turn round with it, by two small wedges driven into notches, *fig. 7,* made in the inside of the ring, and entering similar notches in the outside of D D.

The cylinder, *II H*, to be bored, is fixed firmly concentric with the boring-bar upon a frame of cast iron, consisting of several pieces, which are moveable, and can be set to hold a cylinder of any length or diameter. The first are four cast iron bars, *I, I, I, I*, with slits through them nearly their whole length; they are firmly bolted down to the ground fills, and support two cross bars *K, K*, which can be fixed at any place along the bars *I, I, I, I*, by screws passing through the grooves. The cross bars, *K, K*, have grooves through them in the direction of their length, to receive screws which fix upon each bar two uprights, *L, L*, at any place.

By this sliding of the two cross bars *K, K*, the fixtures are adapted to the length of the cylinder, and by moving the uprights *L, L*, nearer to or farther from each other, the cylinder is fitted in its diameter, horizontal; the weight of the cylinder is supported by blocks and wedges driven under it upon the cross bars *K, K*, and it is kept down by two strong wrought iron-bands, *r, r*, put over it, and drawn down by screws on the top of the uprights *L, L*.

A cross beam is fixed upon the end of the ground fills, into which an upright beam, *M*, is mortised, and its upper end is supported by the beams of the ceiling; the upright has a socket fixed to it, in which a nut for the screw *E* turns, in such a manner that it cannot move backwards or forwards, though it is at liberty to turn round freely; an iron cross, *m m*, is fixed on the nut to turn it by. The end of the screw, *E*, is square, and has a short cross bar, *n*, pinned on it, which has wheels at its ends, and runs upon a thick plank, *N*, supported on iron legs, *o, o*; at one edge of the plank, a piece of iron plate, *p*, is screwed and turned over at top, to form a groove in which one of the wheels run; the cross bar and plank prevent the screw from turning while it can be moved endways along the plank.

In the working of the machine, the first thing is to fix the cylinder; for which purpose the plank, *N*, must be removed, the screw, *E*, drawn out of the boring bar, the upright, *M*, and iron standard, *D*, taken away, the weight of the boring bar being supported by blocks put under the middle of it; the cutter block, and the short cylinder *D D*, *fig. 3*, is now put upon the boring bar, the bars, *d, d*, *fig. 3*, being first put through the slit, *bb*, in *fig. 1*, in the bar at its end towards *D*, where it is enlarged for the purpose; the cutters are fixed in the block by wedges, and adjusted, that they may all be at the same distance from the centre, and that they may bore the cylinder of the proper size. The cylinder is now put over the boring bar, and when the end of the bar comes through the cylinder, the standard, *D*, is replaced; the weight of the bar is now supported, and the blocks in the middle can be taken away, to get the cylinder in its place, and fix it fast, as before described. The screw, *E*, is next introduced into the boring-bar, and pinned into the two cross bars *d, d*, as in *fig. 3*, the upright *M*, is fixed, and the nut of the cross, *m m*, screwed upon the screw *E*; the plank, *N*, is set up, and the whole put in the situation represented in the plate, except that the cutter block is seen on the boring bar towards *A*.

The steam-engine is now set to work, and the boring bar thereby turned; a workman turns the cross, *m m*, and with it the nut of the screw *E*; as the screw is prevented from turning by the cross bar, *n*, on its end, the screw is drawn endways, and consequently the cutter block with it, until it meets the end of the cylinder, when the cutters begin to bore, forming a new smooth cylinder, somewhat larger than the old one left by the casting of the cylinder; as the cutters clear the metal before them, they are drawn further into the cylinder by turning the cross, *m m*, until they

come completely through. The operation is now finished, and the cylinder is removed in the same manner as it was put in, the machine being left in pieces ready to put in another cylinder to be bored.

A great number of cutter blocks, *fig. 4*, are cast, of different sizes for various cylinders, and they all fit upon the same sliding cylinder, *D D*, *fig. 3*.

CYLINDRELLA, in *Entomology*, a species of *PHALENA Tinea*, found at *Hamburgh*.

CYLINDRI, in *Conchology*. A fossil shell, which has been referred to this genus by Mr. Walcott, has been figured in his "Petrefactions found near Bath," *fig. 46*; it has four spires or turns at one end, and is rounded at the other. They are found in the free-stone quarries near Bath.

CYLINDRIA, in *Botany*, (so called because the segments of the border of the corolla are, by their juxtaposition, a continuation of the cylinder of the tube.) *Lour. Cochin. 69*. Class and order, *tetrandria monogynia*.

Gen. Ch. *Cal.* Perianth inferior, tubular, short, permanent, four-cleft; segments acute, coloured, spreading. *Cor.* tubular, four-cleft; segments linear, acute, fleshy, extended jointly into a cylindrical tube, cowed at the tip. *Stam.* Filaments scarcely any; anthers four, two-celled, roundish, compressed, included in the cowls of the segments. *Pist.* Germ egg-shaped; style very short; stigma four-cleft. *Peric.* Berry small, roundish, dry.

Seed solitary, globular, lanuginous.

Eff. Ch. Calyx four-cleft, inferior. Corolla tubular, four-cleft. Berry with one seed.

Sp. C. rubra. (*Blimbingum sylvestre*; *Rumph. Amb. 6. 79. tab. 73.*) A moderate-sized tree. *Branches* ascending. *Leaves* opposite, lanceolate, somewhat serrated, smooth. *Flowers* red, small; peduncles nearly terminal, many-flowered. *Berry* black. A native of woods in *Cochinchina*. *Bosc* observes, that it is very nearly allied to *Protea*.

CYLINDRICAL *Column, Compasses, Mirrors, Wax-candles.* See the several substantives.

CYLINDROID, formed of *κυλινδρος, cylinder*, and *ειδος, form*, in *Geometry*, a solid body, approaching the figure of a cylinder; but differing from it in some respect, e. gr. as having its bases elliptical, but parallel, and equal. The solidity and curve superficies of this solid are found in the same manner with those of the cylinder; *viz.* by multiplying the circumference of the base by the length or axis, for the surface; and the area of the base by the altitude, for the solidity.

CYLINDROID, *hyperbolic.* See *HYPERBOLIC*.

CYLINDROIDEÆ, in *Zoology*, a section or division of the *VOLUTA* in the class of *Vermes Testacea*.

CYLIPENUS SINUS, in *Ancient Geography*, a gulf of the Baltic sea; supposed by *Cellarius* to be the gulf of *Livonia*.

CYLISTA, in *Botany* (*κυλιστος, twining*). *Hort. Kew. 3. 512. Schreb. 1759. Willd. 1351.* Class and order, *diadelphia decandria*. *Nat. Ord. Papilionaceæ, Linn. Leguminosæ, Juss.*

Gen. Ch. *Cal.* Perianth one-leaved, four-parted, very large, permanent; upper division reflexed, bifid at the tip; the rest erect, oblong, acute. *Cor.* papilionaceous, a little longer than the calyx, permanent; standard roundish, emarginate, with a small lobe on each side at the base; wings oblong, obtuse, shorter than the standard, with a process on each side at the base; keel oblong, cloven at the tip and the base, longer than the wings. *Stam.* Filaments, one single; nine united, ascending; anthers roundish.

Pist.

Pist. Germ superior, egg-shaped, compressed; style awl-shaped, ascending; stigma somewhat capitate. *Peric.* Legume ovate-oblong, compressed, one-celled. *Seeds* two, oval.

Eff. Ch. Calyx very large, four-parted; upper division bifid at the tip. Corolla permanent.

Sp. 1. *C. villosa*. Hort. Kew. 3. 36. Introduced into Kew garden in 1776. Native country unknown. It is a shrub, and requires the heat of a stove. 2. *C. scariosa*. Willd. Roxb. Corom. 1.-64. tab. 92. A shrub. *Stem* twining. *Leaves* ternate, with the pubescence of phaseolus; stipules small, lanceolate-awl-shaped. *Flowers* in axillary racemes the length of the leaves; calyx green, veined; corolla yellow. A native of mountains on the coast of Coromandel. As there is no description of *C. villosa* in the Hortus Kewensis, we cannot determine the specific difference of the two plants.

CYLISTANOS, in *Ancient Geography*, a town of Italy, called also *Parthas*.

CYLISTARAUS, a river of Italy, mentioned by Lycophron.

CYLISTI, formed of *κύλιω*, to roll, or tumble, in *Antiquity*, a designation given to the *pancratiaste*; because when the weaker found himself fore pressed by his adversary, he fell down, and fought, rolling on the ground. See PANCRATIUM.

CYLLA, in *Ancient Geography*, a town of the Chersonesus of Thrace, situated on the Hellespont, which had been episcopal; called Cælos by Mela.—Also, a town of Asia Minor, in the Troade. Herodotus.

CYLLANTICUS, or CYLLANICUS, *Traçtus*, a particular country of Asia, in Pisidia. Pliny.

CYLLENA, or CYLLENE, a town situated on the western coast of the Peloponnesus, near Elæa, of which it was the port; supposed to be the present *Chiarenza*. It had two temples: one of Æsculapius, with a fine statue of ivory, and another of Venus, in which was a naked statue of Mercury.—Also, a town of Asia Minor, in the Æolide, furnished, according to Xenophon, *Egyptian*.

CYLLENE, a mountain of the Peloponnesus, in Arcadia, which, according to Pausanias, was the highest in this country. It was situated to the north-east, between the territory of Pellene in Sicyonia and that of Pheneos in Arcadia. On the top of the mountain was a temple of the Cyllenian Mercury, in which was a wooden statue of this god. Near this mountain, according to Homer, was the tomb of Epytus, consisting of a mound of earth encompassed by a balustrade of stones. Epytus, it is said, died of a wound inflicted by a serpent.

CYLOPERA, a place of Greece, in Attica, near mount Hymettus, in which, as Suidas says, was a temple consecrated to Venus.

CYLLOSIS, or CYLLUM, from *κύλλος*, lame, in *Medical Writers*, is used to signify a leg put out of joint outwardly;—also one that is lame and crooked.

CYLONGO, in *Geography*. See CHYLONGO.

CYMA, in *Architecture*. See CYMATIUM.

CYMA, in *Botany*. See CYMF.

CYMA, in *Ancient Geography*, an island in the Mediterranean sea, near Sicily, according to Steph. Byz; but placed by Lycophron near Italy.—Also, a very high mountain of Italy.

CYMATITES, in *Natural History*, a name given by some writers to a species of *ASTROITES*, the lineations of which are indented and represent waves.

CYMATIUM, CYMA, or CYMA, an architectural moulding of an undulated form, being concave at top and con-

vex at bottom. (See *Plate of Mouldings*.) It is also called *doucine* and *gola diritta*. Some write the word *smaise*, from *smus*, *canus*, *flat-nosed*, but this etymology is improbable: the beauty of the moulding consists in its having its projection equal to its height. M. Felibien, therefore, rejects this origin; contending, that the moulding is not so denominated from its being the uppermost member of the cornice, but, according to the sentiments of Vitruvius, from its being waved, from the Greek *κυματός*, *undula*, of *κύμα*, *wave*. This is certain, that Vitruvius sometimes uses the word *unda* for cymatium; and sometimes *lysis*, i. e. *solution*, *separation*; because corniches, where the *cymaises* are found, separate one piece of architecture from another; as the pedestal from the column, and the frieze from the cornice. But it must be observed, that Vitruvius appears to use the term cymatium for any subordinate moulding which terminates a principal member without regarding its particular form. Thus he mentions the Doric cymatium, which, from the authority of ancient examples, we should pronounce to be an ovolo, and the Lesbian cymatium which Newton supposes to be an ogee.

Felibien makes two kinds of cymatiums; the one *right*, the other *inverted*: in the first, that part which projects the furthest is concave, and is otherwise called *gula recta*, and *DOUCINE*. In the other, the part that projects furthest is convex, called *gula inversa*, or *TALON*.

Our architects do not chuse to give the name cymatium to these mouldings, except when found on the tops of corniches, but the workmen apply the name indifferently, wherever they find them. Palladio distinguishes the cymatium of the *corniche* by the name *intavolata*.

CYMATIUM, *Tuscan*, consists of an ovolo, or quarter round. Philander makes two Doric cymatiums, whereof this is one: Baldus calls this the Lesbian *astragal*.

CYMATIUM, *Doric*, is a cavetto; or a cavity less than a semicircle, having its projection subduple its height.

CYMATIUM, *Lesbian*, according to Vitruvius, is what we otherwise call *talon*; viz. a concavo-convex member, having its projection subduple its height.

CYMBACHNE, in *Botany*, (from *κύμα*, a boat, and *αχνη*, a glume or chaff.) Mart. Mill. Retz. Obs. 6. 36. Class and order, *polygamia monœcia*. Nat. Ord. *Gramina*.

Gen. Ch. Hermaphrodite flowers. *Cal.* Glume two-valved, one-flowered, so placed that each valve is pressed close to the rachis and parallel, not one hidden by the other; outer valve linear, blunt, ciliated at the back; inner equal in length, semiovate, acute, boat-shaped, very much compressed, striated, coloured, ciliated at the back, enclosing the corolla. *Cor.* Glumes two, hyaline, smaller than the calyx. *Stam.* Filaments three; anthers black. *Pist.* Germ minute; style simple; stigmas two, black-bearded. Female flowers. *Cal.* one valved, egg-shaped, slightly bifid at the tip, ciliated at the edge, opposite to the rachis, pressed close. *Cor.* none. *Pist.* as in the hermaphrodite, but with longer stigmas.

Eff. Ch. Inflorescence half-spiked. *Herm. Calyx* two-glumed, one-flowered, parallel to the rachis; outer valve linear; inner boat-shaped. *Fem.* Calyx one-glumed, egg-shaped, opposite to the rachis.

Sp. *C. ciliata*. Mart. Retz. *Culms* several, slender, a foot high, simple or branched, with a single leaf, or leaflets. *Leaf* short, slender, ciliated on the edge above the sheath with long separate hairs; sheath truncate, with a pale brown mouth and ciliated. *Spikes* two, terminal, linear, an inch and a half long, a line broad, some hermaphrodite, others female. *Rachis* linear, membranous, flat behind with three longitudinal streaks alternately and flexuously hollowed out in front. A native of Bengal.

CYMBAL, a musical instrument, used among the ancients; called by the Greeks *κυμαλον*, and by the Latins *cymbalum*.

Sylburgius derives the word from three several roots, *viz.* from *κυρος*, *crooked*; from *κυμαλον*, *cup*; and from *φωνη*, *voice*. Isidore derives it from *cum*, and *ballematica*, an immolated dance used to accompany this instrument. The real etymology appears to be from *κυμαλον*, *cavity*.

The cymbal was of brass, like our kettle-drums; and as some think, resembling them in their form, but smaller, and applied to a different use.

Cassiodorus and Isidore call it *acetabulum*, the name of a cup or cavity of a bone wherein another is articulated; and Xenophon compares it to a horse's hoof; whence it must have been hollow; which appears, too, from the figure of several other things denominated from it: as a basin, caldron, goblet, casque; and even a shoe, such as those of Empedocles, which were of brass.

In reality, the ancient cymbals appear to have been very different from our kettle-drums, and their use of another kind: to their exterior cavity was fastened a handle; whence Pliny compares them to the upper part of the thigh, *coxendicibus*; and Rabanus to phials.

They were struck against one another, in cadence, and made a very acie found. Their invention was attributed to Cybele; whence their use in feasts and sacrifices; setting aside this occasion, they were seldom used but by dissolute and effeminate people. M. Lampe, who has written expressly on the subject, attributes the invention to the Curetes or inhabitants of mount Ida, in Crete; it is certain these, as well as the Corybantes, or guards of the kings of Crete, and those of Rhodes and Samothracia, were reputed to excel in the music of the cymbal. See CORYBANTES.

The cymbals of Bacchus were two small brass vessels, somewhat in the form of a shield, which being struck together by the hands, gave a sound. The well-known statue of the dancing fawn has one of these in each hand. An instrument of this kind is frequently to be seen in the Bacchanalian sacrifices or processions represented in ancient sculpture. It is still in general use in eastern countries, and has lately been introduced among the troops of almost all the princes of Europe, on account of its utility in marking the steps of the soldiers, with force and precision during their march. *Crotalo* is the modern Italian name for this instrument; but *κροταλον* in Greek, and *crotalum* in Latin, implies one that was different from the cymbalum; a kind of castanet.

The Jews, too, had their *cymbals*, which they called *צלצלים*, or *תצללים*; or, at least, instruments which the Greek, Latin, and English translators render cymbals; for as to their matter, form, &c. the critics are wholly in the dark.

Le Clerc has taken some pains to prove, that the *tzilzelim*, which our version, after the septuagint, renders cymbals, were only a couple of hollow demiglobes of brass, or some other tinkling metal, about 6 inches in diameter, which they used to shake one against another like a pair of castanets, because we find some such instruments to have been in use among the ancients, and because the root *tzalzal* often signifies *to tinkle*.

The modern cymbal is a mean instrument, chiefly in use among vagrants, gypsies, &c. It consists of steel wire, in a triangular form, whereon are passed five rings, which are touched and struck along the triangle with an iron rod held in the left hand, while it is supported in the right by a ring, to give it the free motion. Durandus says that the monks

used the word cymbal for the cloister-bell, used to call them to the refectory. See BELL.

CYMBALARIA, in Botany. Bauh. Pin. See ANTIRRHINUM *Cymbalaria*.

CYMBARIA, (from *κυβη*, a *boat*, alluding to the shape of the fruit.) Linn. Gen. 751. Schreb. 1008. Willd. 1146. Gært. 312. Juss. 119. Clafs and order, *ydli namia angiospermia*. Nat. Ord. *Perfonata*; Linn. *Scrophularia*; Juss.

Gen. Ch. *Cal.* Perianth ten-toothed, erect, permanent; two opposite teeth stronger and more spreading; the rest erect, linear. *Cor.* monopetalous, ringent; tube oblong, bellied; border two-lipped: upper lip two-parted, reflexed, obtuse; lower lip three-cleft, obtuse. *Stam.* Filaments four, the length of the tube; anthers bifid, prominent. *Pyl.* Germ superior, egg-shaped; style difform, the length of the stamens, incurved at the tip; stigma obtuse. *Peric.* Capsule elliptic-heart-shaped, two celled, two-valved; partition contrary to the valves. *Seeds* several, oblong, compress'd.

Eff. Ch. Calyx ten-toothed. Capsule heart-shaped, two-celled. Nearly allied to antirrhinum.

Sp. C. *laurica*. Linn. Sp. Pl. Mart. Lam. Willd. Amm. Ruth. 47. tab. 1. fig. 2. Gmel. Sib. 3. 198. n. 8. Gært. tab. 53. fig. 12. Lam. Ill. Pl. 530. Whole plant slightly pubescent and hoary. *Root* perennial, fibrous. *Stems* several, six or seven inches high; branches few, opposite, barren. *Leaves* opposite, lanceolate-linear, acute. *Flowers* large, yellow, tinged with purple on the inside, lateral, almost sessile. *Capsule* membranous, slender, brown bay, marked with a deep groove on each side, dehiscent only at the edge; valves finally narrower than the receptacle; receptacles large, fungous, white, kidney-shaped, connected with the partition on each side by an intermediate flat substance. *Seeds* from twelve to fifteen in each cell, surrounded by an irregular membranous edge, pendulous from a nearly terminal umbilicus, imbricated downwards, bay-coloured. A native of mountainous rocky places in Siberia. This genus is distinguished from all the rest of its natural family by the calyx.

CYMBIDIUM, (from *κυβη*, a *boat*, alluding to the shape of the tip of the flower.) Willd. v. 4. 94. Swartz. Act. Holm. 1800 p. 236. Tracls on Botany, 167. Schrad. Journal, 1799. 213. t. 1. Sco. Orchid. in Schr. Neues Journ. v. 1. 72. Clafs and order, *gynandria monandria*. Nat. Ord. *Orchideae*, Linn. Juss.

Gen. Ch. reformed. *Cal.* three leaved. *Cor.* Petals two, generally smaller than the calyx-leaves; nectary a lip, concave at the base, without any spur, separate from the style at its edges, its termination spreading, either upward or downward, undivided or lobed. *Stam.* Anther an hemispherical deciduous terminal lid, of two or four cells; masses of pollen pedicled, in pairs. *Pyl.* Germen inferior, oblong or ovate, erect, furrowed; style semi-cylindrical, often gibbous, concave in front; stigma either concave or convex, in the fore-part of the style near the top. *Peric.* Capsule oblong or ovate, with three or six ribs, with one cell and three valves, opening by clefts between the ribs. *Seeds* numerous, minute, each clothed with a chaffy tunic, inserted into the downy internal ridges of the valves.

Eff. Ch. reformed. Calyx-leaves upright. Lip concave at the base, without a spur, with a spreading border. Anther a terminal lid, deciduous. Pollen gibbous.

Obf. Very rarely the two lowermost leaves of the calyx are united into one. For the reasons of our thus denominating the three outer petals of Linnæus, or outer calyx-

leaves of Swartz and Jussieu; see Sm. *Introd. to Botany*, p. 461.

This genus was founded by Dr. Swartz, and consists in his last work on the subject (*Genera et species orchidearum*, the first article in Schrader's *New Journal of Botany*, publ. 1805), of 43 species, 29 of which are said to be parasitical and 14 to grow on the ground. Among the former are *Cymbidium coccineum*, (*Epidendrum coccineum*, Linn.)—*C. tripterum*. (*E. tripterum*, Sm. *Icon. Pit. t. 14.*) a native of Jamaica, which flowered several years ago in the collection of the Hon. Mrs. Barrington, and also at Kew, but has rarely been seen in our gardens. Its numerous green bulbs, resembling a dish of green-gage plums, bear long narrow leaves, and elegant spikes of white flowers. Many beautiful species of *Epidendrum*, or *Limnorum* in Linnæus, Roxburgh, &c. are referred to this section by Dr. Swartz, which do not all well agree togeth'er. Among the *terrestrial* species is *C. pubellum*, (*Limnorum tuberosum*, Linn. *Curt. Mag. t. 116.*) and others allied to it.—*C. hyacinthinum*, Sm. *Exot. Bot. t. 60.*—*C. giganteum*, (*satyrium giganteum*, Linn.) with several other Linnæ in *Satyria* from Africa.—*C. corallorhizon*. (*Ophrys corallorhiza*, Linn. *Engl. Bot. t. 1547.*) is the only British *Cymbidium*. This has lately been found, much more plentifully than heretofore, by Mr. Edward Maughan, in boggy shady ground not many miles from Edinburgh. It grows also in the more northern parts of Europe and America. The fleshy roots, branched like a coral, and fragrant like *Vanilla*, even long after drying, are very remarkable. The flowers are small, greenish, and inconspicuous. Leaves none, except a few sheathing scales.

The genus of *Cymbidium* is not one of the most natural, its species having no very striking habit or aspect in common, and there being some Indian *Orchideæ*, lately discovered, in which the absence or presence of a spur appears of no moment as to generic distinction. See LIMNORUM.

CYMBIUM, in *Natural History*, a name given by many authors to a kind of sea-shell, commonly called the gondola shell. It is of the genus of the concha globosa, or dolium, and there are several species of it.

CYMBURUS, in *Botany*, (from *κύβος*, *cavus recessus*, and *οὐρα*, *cauda*) Salisb. *Parad. Lond.* 49 (Sherardia; Vahl. *Stachytarpheta*; Vahl) Class and order, *diandria monogynia*. Nat. Ord. *Personata*, Linn. *Vitices*, Juss. *Pyrenaceæ*, Vent.

Gen. Ch. Cal compressed, seated in a lateral hollow of the common peduncle. Cor. monopetalous; tube crooked; border rather funnel shaped, unequally quinquefid. Stam. Filaments four; two barren; anthers two, long, two-lobed; one lobe placed perpendicularly upon the other. Pist. Germ superior; style bifurcated, the length of the tube; stigma cap-shaped. Seeds two, naked. Linn. Juss. Gerit. Almost naked. Vent. Peric. a thin pellicle adhering to the seeds, but continuous with the style, two-seeded. Salisb.

Ess. Ch. Calyx compressed, seated in a hollow of the common peduncle. Anthers long; one lobe placed perpendicularly upon the other. Stigma cap-shaped.

Sp. 1. *C. mutabilis*. Salisb. *Parad.* 49. (*Stachytarpheta*; Vahl. *Sp. Pl.* 1. 205. *Zephania mutabilis*; Lam. *Ill.* 257. *Verbena mutabilis*; Jard. *Malm.* 36. *Jaqc. Ic. Coll.* 2. 334. *V. Orubica tenuifolia*; Herm. *Prod.* 258. *V. americana flore coccineo*; Breyer. *Prod.* 2. 103. *Sherardia tenuifolia*; Vahl. *Sex.* 49.) "Leaves egg-shaped, tomentous underneath; bractes spreading and bristle-shaped at the tip; back of the calyx scarcely toothed; corolla externally vivid-purplish; stigma entire." Stem becoming somewhat woody,

with widely spreading branches, sharply four-cornered, hairy. Leaves from two and a half to four inches long, yellowish-green, egg-shaped, serrated, obtuse, hairy, paler and more nappy underneath, wrinkled; petioles half an inch long or more, convex on the upper side, bordered almost to the bottom with the decurrent leaf. Flowers in a long spike; common peduncle hollowed out for each flower as in some of the grasses; bractes shorter than the calyx; calyx half an inch long, exceedingly compressed, with two deep furrows next the peduncle, hairy on the outside; corolla an inch long or more; tube dark red, with a whitish bottom, cylindrical, thickly bearded within on one side with erect hairs; border deep scarlet, gradually changing to a lilac tinge, more than twice as long as the tube, its lower part only a little wider than the tube, somewhat compressed with two furrows in front, where it is internally bearded up to its mouth; upper part horizontal, with a deep purple heart-shaped mark about the mouth, divided into five short rounded unequal segments; filaments whitish, short, bearded on one side; barren ones very narrow; anthers pale yellow; pollen consisting of three or four globular bodies confluent with a still larger central one; style pale yellow, smooth; stigma green, smooth, Salisb. A native of the island of Oruba and the adjacent continent of North America. 2. *C. orubica*. (*Verbena orubica*; Linn. *Sp. Pl. Pluk. Alm.* 383. tab. 228. fig. 4. and tab. 327. fig. 7. *Sherardia urticae folio*; Ehret. *Pict.* tab. 5. fig. 1.) "Spikes very long, leafy." A native of the island of Oruba. 3. *C. jamaicensis*. (*C. urticifolia*; Salisb. *Parad. Lond.* 53. *Stachytarpheta jamaicensis*; Vahl. *Sp. Pl.* 1. 207. *Verbena jamaicensis*; Linn. *Sp. Pl.* 3. *Jaqc. Obs. Fasc.* 4. p. 6. tab. 85. *V. erecta divisa*; Brown. *Jam.* 115. *V. folio subrotundo*; Sloan. *Hist.* 171. tab. 107. fig. 1. *Sherardia tenuifolia*, flore purpuro; Vaill. *Sex.* 49. *Valerianoides*; Boerh. *Hort. Lugdb.* 2. 270.) "Leaves oval-lanceolate, smooth; middle nerve somewhat hairy underneath; bractes close pressed their whole length, ovate-acuminate; back of the calyx not toothed; stigma entire." Stem becoming woody, hairy when young. Leaves bright green, sharply serrated; petioles long. Flowers in a very long slender spike, scented; common peduncle with a deep shining cavity; bractes membranous towards the base, slightly torn or crenulate; calyx only about two lines and a half long, exceedingly compressed, four-toothed, the dorsal nerve terminating below the top; corolla violet-blue, internally bearded as in *C. mirabilis*; filaments white; anthers sulphur coloured; stigma greenish, smooth. Salisb. A native of the island of Barbadoes. 4. *C. indica*. (*Verbena indica*; Linn. *Sp. Pl.* 2.) "Spikes very long, fleshy, naked; leaves lanceolate-egg-shaped, obliquely toothed; stem smooth and even." Similar to the preceding, but differs in having the stem entirely smooth, the leaves more lineate, not serrated, gradually narrowed at the base, with petioles not margined. Linn. Flowers blue. A native of the island of Ceylon.

CYME, *СУМА*, is a form or mode of inflorescence, consisting of several flower-stalks, all springing from one centre or point, but each stalk is variously subdivided, and in this last respect, the cyme differs essentially from an umbel, the subdivisions of the latter being formed like its primary division, of several stalks springing from one point. This difference, however slight it may appear in description, is of great importance in nature. Examples of a cyme are found in the genus *viburnum*, of which the common *launimus* is a species. In several of these the subdivisions are numerous or often repeated, and some of them are umbellate like the primary division; but this is of no moment, provided any

of them be irregular or dispersed. In an umbel, which mode of flowering chiefly belongs to a natural order of plants thence called umbellate or umbelliferous, the inflorescence is never more than twice compounded, consisting of a general umbel formed of several partial ones.

Linnæus considered the cyme, as well the umbel, kinds of aggregate flowers. See AGGREGATE and COMPOUND. Their stalks he reckoned as a branched receptacle, their *bractææ* or floral leaves, as a kind of calyx remote from the flower, for which he invented the term *involucrum*. Hence the flowers became florets, *fosculi*. Many arguments may be found in favour of this hypothesis, especially what are derived from the analogy between such aggregate flowers and the proper compound or syngenesious ones, both having frequently radiant, female, or even neuter, marginal flowers or florets. In the marigold, *calendula*, a true compound flower with united anthers, the central florets are entirely male, the marginal ones female, exactly as in the umbelliferous flower *oenanthe*; and there are many similar instances in both families. In the cyme of *viburnum opulus*, and various species of *hydrangea*, the flowers of the circumference are very often dilated or radiant, and in that case neuter. Such flowers become double, as it is called, not by multiplication of their petals, or a change of stamens or styles into the latter; but by a strange dilatation of their petals, attended with obliteration of the organs of impregnation. It seems to us, nevertheless, most natural and convenient to esteem both the cyme and the umbel modes of inflorescence, as they so insensibly, in some instances, slide into a *corymbus*, a *capitulum*, or a *spica*; or at least evince a common generical affinity, if we may so express it, with those. We would therefore follow the example of those who characterize the genera of umbellate, as well as cymose, plants by the real parts of fructification alone, being well convinced that to depend on such only, is one of the foundation of the Linnæan maxims. See GENUS and INFLORESCENCE. S.

CYME, called also incorrectly *Cuma*, in *Ancient Geography*, a very handsome town of Asia Minor, in *Æolia*, at the lower part of a small gulf of the same name, north-east of Phocæa. It was also called *Phiririconites*, from mount Phiricius, in the Locride, above Thermopylæ. Some vestiges of this town are discernible in a place called *Nemour*.

CYMEUS SINUS, the gulf of Cyme, was formed by the sea of the Archipelago, and extended eastward along the coast of Etolia, between a peninsula which advanced to the north-west, towards the city of Lesbos, and another which advanced to the south-west, towards the entrance of the gulf of Smyrna.

CYMENE, in *Botany*, a name given by the ancient Greeks to a plant with which they used to dye woollen things yellow, and with which the women also used to tinge the hair yellow. The *cymene* of the Greeks is evidently the same plant with the *lutum* or *lutea herba* of the Latins; and this is described to have leaves like the *linum*, or flax, and flowers like the *genista*. It is plain from this, that the *lutum* of the Romans, is the *genista tinctoria* of Linnæus, or dyer's weed, still used to dye yellow, and which answers to all the characters of the Roman description.

CYMINALIS, a name used by some authors for the *gentian*, the plant whose root is the fine bitter drug of that name.

CYMINO, *Cataplasm* δ . See CATAPLASM.

CYMINOSMA, in *Botany*, Gært. See LAXMANNIA.

CYMINUM. See CUMINUM.

CYMODŒEA. Konig. *Annals of Botany*, 296.

Class and order, *diœcia? tetrandria*. Nat. Ord. *Innudata*, Linn. *Naiades*, Juss.

Gen. Ch. *Cal.* and *Cor.* none. Barren flowers. *Stam.* Filaments none; anthers four, lanceolate-acuminate, erect, connivent; fixed to a scape or peduncle, (filament, Cassin) which is bifid or quadrifid at the top; containing a solid mass of pollen, which, when mature, becomes filamentous. Fertile flowers. *Pist.* Germens two, nearly sessile, convex-plane, approximate; style to each germen one, filiform; stigmas awl-shaped. *Peric.* Capsules two, approximate, compressed, two-valved; valves united by an ambient ring.

Sp. C. *æquorea*. Konig. ubi supra, Pl. (Plucagrostis Theophrasti major; Caulini Monog. cum. tab.) Stem (root?) perennial, rather woody, creeping, zig-zag, jointed, throwing out filiform radicles at each joint; branches (shoots?) rising from each joint, annulated towards the base. *Leaves* linear, obtuse, membranous, sheathing; sheaths flat, closely covering each other. *Scape* or peduncle from the sheaths of the leaves, long, attenuated, nearly the length of the leaves; anthers attached lengthwise so as to leave a space at the two opposite sides, opening longitudinally, and discharging a white capillary pollen; styles about an inch long; stigmas two to each style, longer than the style, dark yellow at the upper part, tubular when viewed through a microscope. *Fruit* roundish, compressed, with elevated margins, terminated by the remains of the style, rather woody, with a thin pulp. A native of the bay of Naples, totally immersed in the sea.

CYMOTHÆ, in *Ancient Geography*, a fountain of the Peloponnesus, in Circædia; placed by Pliny near the mountain *Scioessa*.

CYNA, a town of Asia Minor, in Lydia.

CYNADRA, a fountain of the Peloponnesus, in the Argolide.

CYNÆDUS, in *Ichthyology*, a species of LABRUS, which see.—Also, a name given by Gronovius to the SPARUS *Sargus*, and SPARUS *Dentex* of Gmelin.

CYNÆTHA, a town of Thrace, situated at the foot of mount Nerife. Steph. Byz.—Also, a town of Peloponnesus, in Arcædia, on the river Crathis. Pausanias says, that, in his time, many altars, consecrated to different deities, and a statue of the emperor Adrian, remained on the site of this town. Bacchus had a temple here, in which, in the winter season, the feast of this god was celebrated with peculiar ceremonies.

CYNAMOLGI, a name given by the Greeks to a people seated in the southern parts of Ethiopia. They had long beards, and kept very fierce dogs, in order to hunt Indian oxen, of which prodigious herds came amongst them every year.

CYNANCHE, in *Medicine*, $\kappa\upsilon\upsilon\acute{\alpha}\nu\chi\eta$, from $\kappa\upsilon\upsilon\acute{\alpha}$, a dog, and $\acute{\alpha}\nu\chi\eta$, I strangle; hence probably the French *esquinancie*, and our own *quinansy* or *quinsy*. This term is applied by nosological writers to inflammations of the throat in general. It is synonymous with the Latin, *angina*. See ANGINA.

Sauvages has described a number of species of cynanche; but Dr. Cullen reduced them to five, setting aside all those which were only symptomatic, or mere varieties of the same disease. Dr. Cullen's species are, 1. *Cynanche tonsillaris*; 2. *C. maligna*; 3. *C. trachealis*; 4. *C. pharyngea*; 5. *C. parotidea*.

1. *Cynanche tonsillaris*, is an inflammation of the mucous membrane lining the throat, and affecting especially the tonsils, and spreading from thence along the velum and uvula.

The

CYNANCHUM.

The disease is marked by a redness of the parts, accompanied by swelling, which is sometimes considerable, so as to render the act of swallowing painful and difficult, or even to impede it almost entirely. There is also a troublesome clamminess of the mouth and throat, with a frequent but difficult excretion of mucus; there is often a pain shooting into the ear: the voice is altered, and articulation rendered indistinct. A degree of fever is generally present.

This species of quinry is never contagious. It terminates frequently by resolution, sometimes by suppuration, but hardly ever by gangrene. The progress of this inflammation to suppuration, is sometimes, indeed, very rapid; at other times there are several small abscesses, which break one after another, and the disease is tedious. Occasionally the tonsils become enlarged and hard after this inflammation, and remain so for years. When a large imposthume breaks, there is generally sudden relief from the pain, difficulty of breathing, swallowing, and speaking; although often no matter is thrown up, but passes down the œsophagus.

The disease is commonly traced to exposure to cold. It affects the young and sanguine, and is very liable to return, in some constitutions, upon the application of cold to any part of the body, so as to become almost habitual. It occurs, especially in spring and autumn, when vicissitudes of heat and cold frequently take place. The inflammation and swelling often begin most violently in one tonsil, and afterwards, abating in that, increase in the other.

The remedies for inflammation and the antiphlogistic regimen are to be employed for the cure of this complaint. It is greatly aggravated by heating diet and stimulating medicines. General blood-letting is seldom necessary, but leeches to the neck and external fauces are very useful. Blisters, when early applied to the same parts, are also highly beneficial, and have often had the effect of curing by resolution a violent inflammation of the throat. When suppuration is begun, they can be of little use. Purgatives, repeated occasionally, are of essential benefit; and gentle diaphoretics are useful, whether in the shape of diluents, or saline medicines. The inflammation is often relieved by moderate astringents, and particularly acids, applied to the inflamed parts; hence the use of gargles, containing vinegar, lemon juice, or the mineral acids, and rendered palatable by means of honey or syrup. The acids coagulate the mucus, which adheres about the parts, and cleanse the passages. In many cases, however, no application has afforded more relief, than the vapour of warm water, received into the fauces by means of Mudge's inhaler.

The external applications of oil and volatile alkali, of vinegar, &c. by means of flannel, have little or no efficacy, unless employed so as to excite some inflammation externally.

II. *Cynanche maligna*, is the contagious ulcerated sore throat, which accompanies scarlet-fever. See FEVER, *scarlet*.

III. *Cynanche trachealis*, or inflammation of the wind-pipe, is the technical name which Dr. Cullen, and after him, some other physicians have applied to the disease, popularly termed croup. See CROUP.

IV. *Cynanche pharyngea*, appears to be the same disease as the first species, except that it is seated lower down in the throat.

V. *Cynanche parotidea* is a disease known to the vulgar, among whom it has obtained a peculiar appellation, in every country of Europe, but has been little taken notice of by medical writers. In England it is called the *mumps*; in Scotland, the *branks*; in France, *oreillons* and *ourles*.

It is often epidemic, and manifestly contagious. It comes on with the usual symptoms of pyrexia, which is soon after attended with a considerable tumour of the external fauces, and neck. This appears first as a glandular moveable tumour at the corner of the lower jaw; but the swelling soon becomes uniformly diffused over a great part of the neck, sometimes on one side only, but more commonly on both. The swelling continues to increase till the fourth day; but from that period it declines, and in a few days more passes off entirely. As the swelling of the fauces recedes, some tumour affects the testicles in the male sex, or the breasts in the female. These tumours are sometimes large, hard, and somewhat painful; but, in this climate, are seldom either very painful or of long continuance. The pyrexia attending this disease is commonly slight, and recedes with the swelling of the fauces; but sometimes when the swelling of the testicle does not succeed to that of the fauces, or when the one or the other has been suddenly repressed, the pyrexia becomes more considerable, is often attended with delirium, and has sometimes proved fatal.

As this disease commonly runs its course without either dangerous or troublesome symptoms, so it hardly requires any remedies. An antiphlogistic regimen, and avoiding cold, are all that will be commonly necessary. But when, upon the receding of the swellings of the testicles in males, or of the breasts in females, the pyrexia comes to be considerable and threatens an affection of the brain, it will be proper, by warm fomentations, to bring back the swelling; and by vomiting, bleeding, or blistering, to obviate the consequences of its absence. See Cullen, *First Lines*, § 332.

CYNANCHUM, in *Botany*, *strangle-dog* (from *κυν*, *canis*, and *ανχων*, *strangulo*.) Linn. gen. 304. Schreb. 430. Willd. 408. Gart. 685. Juss. 147. Vent. 2. 429. Class and order, *pentandria digynia*; Linn. *Decandria*; Jacq. *Gynandria pentandria*; Dr. Smith. *Nat. Oid. Contortæ*; Linn. *Apocinea*; Juss.

Gen. Ch. *Cal.* Perianth one-leaved, five-toothed, or five-parted, or five-leaved, small, permanent. *Cor.* monopetalous; tube generally very short; border nearly flat, five-parted; divisions long, oblong, acute. *Nect.* surrounding the organs of impregnation, nearly cylindrical, five-parted, furnished with five membranous appendices which have a kind of two-celled bag destined to receive the protruding pollen-masses. *Pist.* Germen superior, oblong, two-cleft; styles two, sometimes only one, or none, short; stigma single, common to both styles, or both germs, abrupt, very thick, pentangular. *Stam.* Five two-lobed glands seated on the angles of the stigma, and producing in each of their cells a mass of glutinous pollen, which finally protrudes with a very slender pedicel, and is received into one of the cells of the appendices to the nectary. *Peric.* Follicles two, oblong, acuminate, one-celled, opening lengthwise. *Seeds* numerous, oblong, crowned with a down, imbricated on a free receptacle.

Ess. Ch. Corolla contorted. Nectary cylindrical, divided upwards into five segments, and furnished with five membranous appendices, which receive the pollen masses of the anthers, into as many two-celled bags.

Obs. The complex and peculiar structure of the flower in this genus, and some others nearly allied to it, has occasioned much perplexity to the best botanists, and has been differently understood by different authors. The appendices to the nectary bear a great resemblance to filaments, they have accordingly been so called by Linnæus and others, and their two celled bags have in consequence been considered as real anthers. But Dr. Smith observes, that the pollen

is neither attached to, nor secreted by these cells, but is produced in five pair of glutinous masses, exactly like the pollen of the orchidæ, from five glands inserted upon the stigma, so that no plants can be more certainly gynoandrous. See his Introduction to Botany, p. 495.

Sp. 1. *C. cymbat.* Lam. Mant. 92. Mart. 1. Lam. 1. Willd. 1. (*Euphorbia viminalis*; Linn. Sp. Pl. 9. Apocynum vineale; Bass. Act. bonon. A. guineen.; Herm. parad. 51. Felsel Tavil. Alp. Fig. tab. 190?) "Stem twining, perennial, leafless." Whole plant milky. *Stems* several, from three to six feet high, about the thickness of a goose-quill, greenish, smooth, twining about each other, or any neighbouring support, and then sometimes rising to the height of ten or twelve feet, with opposite branches on their upper part. A native of the Cape of Good Hope; and of Egypt if the reference to Aipinus be correct, but La Marck thinks it dubious. 2. *C. pyratechnicum.* Lam. Forst. Æg. 53. n. 79. "Stem shrubby, naked; peduncles solitary, axillary, tubercled; flowers pedicelled, in heads." La Marck thinks it distinct from the preceding. A native of the Cape of Good Hope. 3. *C. verticillare.* Lam. Enc.* (*C. filiforme*; Mart. 15. Willd. 2. Linn. jun. Supp. 169.) "Stem erect, quite simple; leaves linear; flowers axillary, whorled." A native of the Cape of Good Hope. 4. *C. hastatum.* Lam. Enc.* "Stem twining, shrubby, much branched; branches nearly filiform; leaves hastate-linear, acute, smooth. Brought from the Levant by Dr. André, and cultivated at Paris. 5. *C. crispum.* Willd. 3. Thunb. prod. 46. "Stem erect, herbaceous; leaves lanceolate, curled; flowers lateral." A native of the Cape of Good Hope. 6. *C. mauritianum.* Lam. Enc.* Commers. Herb. (Funis papus; Rumph. Amœ. 5, 14. tab. 10 and 11?) "Stem twining, shrubby; leaves ovate-lanceolate, smooth on both sides." *Follicles* cylindrical, awl-shaped, spreading horizontally. 7. *C. tenellum.* Linn. jun. Supp. 168. Mart. 13. Lam. 14. Willd. 4. "Stem herbaceous, somewhat twining; leaves ovate-oblong." *Stem* filiform, with alternate branches. *Leaves* about the size of those of common chickweed, opposite, petioled, smooth, mucronate. *Umbels* lateral, irregular, shorter than the leaves, sessile. *Flowers* small. *Follicles* awl-shaped, the length of a finger. Found by Mutis in New Granada. 8. *C. filiforme.* Mart. 26. Lam. Enc.* Jacq. Amer. 86. tab. 60. fig. 1. pict. tab. 86. "Stem twining; leaves ovate-acuminate, flat shining; umbels globular." Milky. *Stems* very numerous, cylindrical, filiform, shining, branched. *Leaves* scarcely an inch and half long, quite entire, petioled. *Umbels* small, erect, lateral, alternate; common peduncle filiform, twice the length of the petioles. *Flowers* without scent, small; petals and nectary snow-white. A native of New Spain about Carthagea. 9. *C. clausum.* Mart. 27. Lam. Enc.* Jacq. Amer. 87. tab. 60. fig. 2. pict. 1. 87. "Stem twining; leaves acuminate-oblong, rolled back at the edge; flowers umbelled." Milky. *Stems* numerous, cylindrical, smooth. *Leaves* from two to three inches long, quite entire, veined, shining. *Umbels* lateral, solitary. *Flowers* without scent; petals and nectary snow-white. A native of New Spain. 10. *C. undulatum.* Linn. Syst. Nat. 9. Mant. 54. Mart. 10. Lam. 5. Willd. 23. Jacq. Amer. 85. tab. 58. pict. 45. tab. 84. "Stem twining; leaves lanceolate-ovate, smooth; umbels globular." A milky plant, entirely smooth. *Stems* cylindrical. *Leaves* four inches long, on very short petioles, quite entire, thick. *Umbel* small, solitary, close; common peduncle lateral, cylindrical, thickish, usually shorter than the petiole. *Flowers* small, without scent, firm; calyxes ash-coloured,

five-leaved; leaflets ovate, concave, spreading; corollas nearly the colour of the calyx on the outside, dirty purple within; tube globular dehiscent, a little longer than the calyx; border five-cleft; segments flat, very blunt spreading much, half the length of the tube; throat spreading very wide. A native of New Spain about Carthagea. 11. *C. reticulatum.* Mart. 17. Willd. 22. Retz. Obs. 2. 15. "Stem twining; leaves egg-shaped, acuminate, smooth, flat umbels axillary." *Stem* woody; with a thick, whitish, corky bark; branches twining, striated, smooth. *Leaves* distant, petioled, smooth; upper ones lanceolate. *Flowers* small, hairy on the outside, unequally pedicelled; in peduncled, axillary umbels. *Follicles* egg-shaped, smooth. A native of the East Indies. 12. *C. obtusifolium.* Mart. 12. Lam. 12. Linn. jun. Supp. 169? Willd. 5. "Stem twining, herbaceous, smooth; leaves oblong-lanceolate, obtuse at the tip with a point; umbels peduncled, lateral." Lam. "Stem twining, herbaceous, leaves oblong, rounded at the tip, ending in a point; umbels lateral." Linn. jun. Smooth in all its parts. *Stems* a foot and half long, slender, cylindrical. *Leaves* opposite, petioled, somewhat nerved underneath. *Flowers* small, from twelve to fifteen in an umbel, on unequal pedicels. Lam. A native of the Cape of Good Hope. La Marck's plant was communicated by Sonnerat; Linnæus's by Thunberg. 13. *C. pedunculare.* Lam. Enc.* (Apocynum scandens, foliis lauri, flore albo umbellato; Plum. Cat. 2. Burm. Amer. tab. 27. fig. 2. Aubl. Guian. 273.) "Stem twining; leaves egg-shaped, smooth on both sides, peduncles axillary, very long, solitary, umbelliferous." *Flowers* pure white; peduncles a foot long. A native of Guiana. 14. *C. longiflorum.* Mart. 25. Jacq. Amer. 85. tab. 59. pict. 85. "Stem twining; leaves oblong, acute, shaggy; flowers umbelled." Milky. *Stems* fifteen feet high, cylindrical, hairy. *Leaves* half a foot long, cordate at the base, quite entire, thickish, with hairy veins and nerves, on short and hairy petioles. *Umbels* lateral, solitary, at most seven-flowered; common peduncle, hairy, thick, cylindrical, the length of the petiole; involucre many-leaved, unequal. *Flowers* without smell or beauty; calyxes pale greenish; corolla pale without, fuliginous within, beset with numerous silvery hairs; tube elongated. A native of New Spain about Carthagea. 15. *C. parviflorum.* Mart. 20. Willd. 24. Swartzprod. 53. Fl. ind. occ. 1. 537. (Periploca scandens; Plum. ic. 215. fig. 1. "Stem twining, filiform; leaves ovate, awl-shaped at the tip; umbels nearly sessile." A native of the West Indies. 16. *C. capense.* Linn. jun. Supp. 168. Mart. 11. Lam. 13. Willd. 6. Thunb. prod. 47. "Stem twining closely on every side; leaves somewhat cordate-ovate; peduncles many-flowered." *Stem* lofty, scarcely pubescent, even surfaced at the top, not at all cork-barked. *Leaves* opposite, petioled, mucronate, smooth and even; younger ones ovate; more advanced ones emarginate, with a point; peduncles axillary, shorter than the leaves, finely toothed, simple; pedicels alternate, capillary, longer than the peduncle; calyx very short. A native of the Cape of Good Hope. 17. *C. acutum.* Linn. Sp. Pl. 1. Mart. 2. Willd. 6. Jacq. Musc. 1. 16. tab. 1. fig. 4. Gært. tab. 117. (*C. monspeliacum* β. Lam. Scammoniz monspeliacæ affinis; Bauh. pin. 294. Apocynum 3-latifolium; Clus. hist. 1. 125.) "Stem twining, herbaceous; leaves cordate-oblong, smooth." *Root* perennial, creeping. *Stems* annual, six or eight feet high. *Leaves* ending in acute points, in pairs, on long petioles. *Flowers* in small axillary bunches, of a pale flesh-colour; with lanceolate, bluntnish, much-spreading, flat segments; nectary ascending from the tube of the corolla, bel-

bell-shaped, shorter than the corolla, divided about two-thirds of its length into five lanceolate, acute segments, so far removed from each other as to admit five other very small rounded segments, sometimes quite entire, sometimes lacerated or bifid; sheath conical and narrow at the base, thence widening and divided into five two-celled, oblong appendices ending in as many rounded scales, and embracing the mouths of the stigma. Jacq. *Follicles* diverging horizontally as they approach to maturity, cylindrical, acuminate, smooth; receptacle linear, membranous, free. *Seeds* several, imbricated downwards, ovate-oblong, somewhat compressed, with a narrow membranous edge and a lateral umbilicus, reddish-ferruginous, crowned with a tuft of silky-white hairs five times the length of the seed. Gært. The silky glofs may be easily cleared from its seeds by confusion, and affords an excellent flock, which may be adapted to various purposes. The more this flock is carded the finer and more fleecy it becomes, yielding a good warm down, and by its lightness and elasticity, particularly fit for linings or wadding to fur-touts and cloaks against the frost. In carding it will not easily mix with cotton, but it thus acquires a greater consistence and might perhaps be capable of being spun. Tooke's View of Russia, vol. iii. A native of Spain, Sicily, and the neighbourhood of Atrachan. 18. *C. planiflorum*. Linn. Syst. Nat. 6. Mant. 50. Mart. 3. Lam. 2. Willd. 8. Jac. Am. 82. tab. 55. pict. 44. tab. 81. "Stem twining; leaves cordate, smooth, downy underneath; peduncles somewhat racemed, milky." *Root* perennial. *Stems* cylindrical, smooth. *Leaves* oblong-cordate, acuminate, quite entire, very soft; bearded at the origin of the petiole with very short, stiff, ferruginous hairs. *Flowers* without scent, half an inch in diameter, very flat; common peduncles smooth, lateral, solitary; with about five flowers on elongated pedicels; calyx five-leaved; leaflets lanceolate, acuminate, flat, widely spreading, slightly coloured, generally longer than the corolla; tube of the corolla very short, spreading; border with five ovate-roundish, widely-spreading, flat divisions; nectaries five, connected at the base, so as to form one body of the same form and size as the tube of the corolla; producing from their base in the centre of the flower five blunt, upright little appendices, twice as long as the tube of the corolla, furnished at the top with cowed, two-celled, little membranes; pollen-masses in pairs, on short capillary pedicels, inversely egg-shaped, obtuse, columnar, upright, concealed by the cowl; germens the length of the tube of the corolla; styles short, upright; stigma very large, cloven in the centre, funnel-shaped. A native of New Spain about Carthagenæ. 19. *C. rostratum*. Mart. 19. Willd. 9. Vahl. Symb. 3 45. "Stem and petioles bristly; leaves cordate-oblong; divisions of the corolla lanceolate, flat." *Stem* twining, rough with reversed bristles. *Leaves* two or three inches long, opposite, acuminate, beset with thinly scattered hairs on the upper surface, paler underneath, studded with numerous raised dots visible only through a lens, with a sinus open, not closed as in *C. crispiflorum*. *Peduncles* axillary, shorter than the petiole, smoothish; pedicels four or five, somewhat umbelled, unequal, filiform, bristly, often twice the length of the peduncle, shorter than the leaves; segments of the calyx ovate, beset with thinly scattered hairs; corolla, before it expands, ovate, acuminate-beaked; when open, three times the length of the calyx, with a few hairs on the outside. 20. *C. tomentosum*. Lam. 11. "Stem twining, downy; flowers somewhat cordate-oval, mucronate, downy underneath; umbels with about five flowers." *Stems* woody, cylindrical, cottony, whitish. *Leaves* opposite, on short petioles. *Um-*

bels lateral, peduncled; pedicels at least as long as the peduncle. A native of the East Indies, found by Sonnerat. 21. *C. grandiflorum*. Mart. 22. Willd. 10. Cavan. ic. 1. 14. tab. 21. "Stem twining; leaves cordate, ovate-cuspidate, glaucous underneath; corollas coriaceous." *Stem* very long, cylindrical, with a rufous nap at the joints. *Leaves* with one branching nerve; petiole shorter than the leaves, thicker at the base, rather shaggy, often twisted. *Flowers* in short racemes; common peduncle thick, between the two petioles; pedicels in alternate pairs, an inch long; calyx deeply divided into five acute segments; corolla, before it expands, rolled up in a spiral, afterwards much-spreading, deep green on both sides; with five lanceolate, acute divisions near an inch long; nectary yellow, the size of a pea, with five hollows at the base, and as many claws arched inwards; appendices yellow, ovate, concave; attached to the sides of a green pentagon, which terminates a very short prism, rising from the centre of the nectary. anther-glands red; pollen-masses in pairs, on diverging pedicels thinner than the finest hair, club-shaped, transparent, yellow, concealed between the sides of the pentagon, and the appendices almost in a horizontal situation; germens two, approximating, ending in conical styles; stigma common, fungous, large. A native of South America. 22. *C. racemosum*. Linn. Syst. Nat. 7. Mart. 4. Lam. 3. Willd. 12. Jacq. Amer. 81. tab. 54. pict. 43. tab. 80. "Stem twining; leaves ovate-cordate, smooth, acuminate; racemes simple, many-flowered." *Stems* herbaceous, milky, smooth. *Leaves* opposite, petioled, bright green on the upper surface, russet underneath, four inches long. *Flowers* small, white, in lateral racemes; calyx five-leaved; leaflets lanceolate, concave, acute, spreading; tube of the corolla bell-shaped, very short; divisions of the border lanceolate, flat, widely spreading, revolute and emarginate at the tip, a little longer than the calyx; nectary in the centre of the flower, produced from its base, and divided into five erect, ovate, flat segments, the length of the calyx, three jagged and acuminate at the end; with as many short blunt appendices, ending in cowed, two-celled membranes; pollen-masses in pairs, on short pedicels, oval, columnar, upright, concealed in the cells of the cowl; germens two, very small; style single, filiform, upright, almost the length of the nectary; stigma very large, flat on both sides, with five sharp angles. A native of South America near Carthagenæ. 23. *C. nigrum*. Willd. 11. Cavan. ic. 2. 45. tab. 159. "Stem twining; leaves oblong-cordate, smooth, acute; racemes simple, few-flowered." Allied to the preceding, but quite distinct. *Flowers* four times the size, almost black. A native of Mexico. 24. *C. maritimum*. Linn. Syst. Nat. 8. Mant. 54. Mart. 5. Lam. 4. Willd. 13. Jacq. Amer. 83. tab. 56. pict. 44. tab. 82. "Stem twining; leaves cordate, bristly, downy underneath; peduncles aggregate." Milky. *Stems* cylindrical, bristly. *Leaves* acuminate, quite entire, from two to four inches long, petioled. *Flowers* without scent, dark purple; peduncles shortish, one-flowered, springing from a tubercle among the leaves; calyx with five lanceolate, acute, small, spreading segments; tube of the corolla very short, spreading; segments of the border ovate, acute, flat, large, bristly within, spreading; nectary bell-shaped; leaflets inversely cordate, three-toothed, spreading, connected at the sides into one body, of the same colour with the corolla, and of the same length with the calyx; appendices furnished with membranous, cowed, two-celled scales; style cloven at the base; at the height of the scales spread out into a wide and sharply five cornered, body flat on both sides; from the centre of which it again emerges single, filiform, erect, bifid at the tip, the length of

- the corolla. A native of South America, in Tierra Bomba, on the coast. 25. *C. altissimum*. Mart. 24. Lam. * Jacq. Amer. 84. tab. 57. Piët. tab. 83. "Stem twining; leaves cordate, downy on both sides; flowers umbelled." Milky. *Stems* cylindrical; when old, woody, climbing trees to the height of fifty feet, smooth, ash-coloured, leafless; when young, green, downy, leafy. *Leaves* at first two inches, afterwards half a foot long, quite entire, thickish. *Umbels* lateral, solitary, close, hemispherical; common peduncle very thick, cylindrical, downy, scarcely the length of the petioles; involucre many-leaved, unequal. *Flowers* thick, firm, without scent; calyxes greenish ash colour; corollas dirty purple. *Follicles* one abortive. A native of New Spain, about Carthage. 26. *C. radians*. Lam. * (Aclepias; Forsk. Ægypt. 49. 67.) "Stem erect, shaggy; leaves cordate, acute, undulated; umbels terminal." A native of Ægypt. 27. *C. suberosum*. Linn. Sp. Pl. 2. Mart. 6. Lam. 6. Willd. 14. (Periploca carolinensis; Dill. alth. 300. tab. 229. fig. 226.) "Stem twining, rough with hairs; leaves ovate-cordate, acuminate; corymbs axillary; segments of the corolla lanceolate." *Root* perennial. *Stems* slender, covered on the lower part with a thick fungous bark resembling cork, full of fissures; twining above, and, if supported, rising to the height of six or seven feet. *Leaves* two at each joint; on long hairy petioles. *Flowers* green at first, afterwards dusky purple. A native of Carolina. 28. *C. carolinense*. Willd. 15. Jacq. ic. 2. tab. 342. Collec. 2. 288. "Stem climbing, rough with hairs; leaves oblong-cordate, acuminate; corymbs axillary; segments of the corolla oblong, obtuse." A native of Carolina. 29. *C. obliquum*. Willd. 16. Jacq. ic. 2. tab. 341. Collec. 1. tab. 148. "Stem twining, rough with hairs; leaves ovate-cordate, acute; corymbs axillary; segments of the corolla ovate, acuminate." *Leaves* shaggy. Segments of the corolla oblique, revolute at the edges. A native of Carolina. 30. *C. birtum*. Linn. Sp. Pl. 3. Mart. 7. Lam. 7. Willd. 17. (Periploca scandens; Plum. Sp. 2. Apocynum scandens virginianum rugosum; Morif. Hist. 3. 611. § 15. tab. 3. fig. 61?) "Stem twining, shrubby, cork-barked and chinked towards the bottom; leaves ovate-cordate." *Stem* rising to the height of twenty feet or more, if supported. *Leaves* on long, smooth, petioles. *Flowers* yellowish-green. Sent to Miller by Houlton from Jamaica. 31. *C. crispiflorum*. Ait. Hort. Kew. 1. 302. Mart. 16. Willd. 18. Swartz Prod. 52. (Periploca florum divifuris crispis; Plum. ic. 210. tab. 216. fig. 1.) "Stem twining; leaves shaggy underneath, oblong-cordate; sinus closed; petals curled at the tip." A native of South America and the West Indies. 32. *C. prostratum*. Mart. 21. Willd. 19. Cavan. Hist. 5. n. 7. tab. 7. "Stem prostrate, somewhat herbaceous; leaves reniform-cordate, acute, downy underneath." *Stems* a foot high, cylindrical, filiform, branched, knotted, downy. *Leaves* nearly equal to the petioles, quite entire, soft, with an unpleasant smell. *Flowers* in solitary umbels; common peduncles half an inch long, between the two petioles; rays four, one-flowered, surrounded at the base by three little bractes; calyx small, divided half way down into five ovate shaggy segments; corolla deep green, deeply divided into five spreading divisions, with a revolute border; nectary whitish, pitcher-shaped, with five deeply two-horned segments; appendices two from the centre of each horn; one arched towards the stigma; the other very small, opposite to the former, verging outwards. A native of Mexico. 33. *C. monspeliacum*. Linn. Sp. Pl. 4. Mart. 8. Lam. 8. Willd. 20. Cavan. Hist. 44. tab. 50. (Periploca monspeliaca, foliis rotundioribus; Tournef. 93. Scammonea monspeliaca; Bauh. Pin. 294. Apocynum. / 4-latifolium; Clus. Hist. 1. 126.) "Stem twining, herbaceous; leaves reniform-cordate, acute, smooth." *Stems* very long, swelling at the joints, green, smooth. *Leaves* about the length of the petioles, glaucous. *Flowers* on solitary peduncled racemes, between two petioles; calyx small, five-cleft; corolla deeply five-parted; segments linear, white above, pale rose-coloured underneath; nectary whitish, pitcher-shaped, ten-cleft, with five broad shorter segments and five acute longer ones, furnished internally with as many acute appendices, which are raised upwards; sheath in the middle of the nectary, obscurely five-cornered, with five pendulous two-celled appressed little bags, ending at the top in as many orbicular scales, converging towards the top of the sheath; pollen masses in pairs, globular, on very short capillary pedicels; stigma crowned by two little teeth, approximating at the base, afterwards divaricating. Cav. The milky juice of this species thickens when dry, becomes blackish, and resembles the true scammony in its purgative qualities; but it is not equally strong. A native of the south of France and Spain. 34. *C. extensum*. Ait. Hort. Kew. 1. 303. Mart. 9. Willd. 21. Jacq. ic. 1. tab. 54. Misc. 2. 353. (*C. cordifolium*; Retz. Obs. 2. 15.) "Stem twining, shrubby; leaves cordate, acute; peduncles elongated; pedicels filiform; corollas bristly at the edge; follicles ramentaceous." *Root* annual, divided into whitish fibres a foot and half long, and not so thick as a quill, milky. *Stem* twelve feet high, cylindrical, shaggy, with longer hairs thinly interspersed, rough, glaucous, finely tinged with purple. *Leaves* quite entire, almost smooth on both sides, on a long, cylindrical, shaggy petiole. *Flowers* of a pale-greenish colour, pendulous sweet-smelling, opening about six in the evening, and closed by morning; common peduncles between the opposite petioles, generally single, but sometimes one on each side, from half a foot to a foot long, cylindrical, rugged, shaggy, spreading; pedicels an inch and half long, coming out aggregately at intervals; calyx small, somewhat shaggy; with five lanceolate, acute, erect divisions; corolla wheel-shaped; tube somewhat five-angular, longer than the calyx; divisions of the border three times the length of the tube, lanceolate, acute, flat, but rolled back at the sides, spreading; nectary a sheath attached to the tube of the corolla, elevated into a pentagon five-grooved white cone, shorter than the corolla, which consists of five erect obtuse scales, three-lobed at the tip, the middle lobe longer and lying on the vertex of the stigma, with a small two-celled bag for the lodgment of the pollen masses; and on the back at the base of the bag, a lanceolate convex appendix, bent both ways, acute, erecting itself from the middle of the sheath beyond the stigma; pollen-masses in pairs, inversely egg-shaped, compressed, yellow, pendulous, on short pedicels. Stigma capitate, globular, with an obtusely five-cornered rim about the edge. *Follicles* lanceolate, acuminate, mucicated, turgid, glaucous, coriaceous, diverging or reflexed. A native of the East Indies. 35. *C. asperum*. Mart. 18. "Stem twining, shrubby; leaves cordate, acute, rough; flowers lateral." *Stem* twenty feet high or more, very slender, armed with small stinging hairs. *Leaves* in distant pairs at each joint, on slender petioles. *Flowers* in small clusters, sitting close to the stalks, rather large, yellow, star-shaped, spreading open to the bottom. *Follicles* long, swelling. A native of La Vera Cruz, in New Spain; raised by Miller from seeds sent by Dr. Houlton. 36. *C. odoratissimum*. Mart. 23. Lour. Cochinch. 166. (Flos Siamicus, five flos Tunkini; Rumph. Amb. tab. 26. fig. 1.) "Stem twining, cork-barked, and chinked towards the bottom; leaves heart-shaped, acuminate, wrinkled; cymes reflexed."

flexed." *Root* perennial. *Stem* very long, cylindrical, and smooth in the upper part. *Leaves* undulated, smooth, opposite, on long petioles. *Flowers* yellow, very sweet-scented; cymes large, hemispherical, axillary, reclined; calyx five-leaved; leaves ovate-lanceolate, undulated, nearly erect; corolla salver-shaped; tube thick, short, inflated at the base; border large, with five oblong somewhat reflexed divisions; nectary cylindrical, thick, erect, with five connivent segments; appendices five, membranous, adhering to the outside of the nectary, and terminated by compressed, acute, two-celled bags incumbent on the stigma; stigma sessile, ovate, emarginate. A native of Siam and Cochinchina, cultivated about Canton. In fragrance it does not yield to jasmium sambac, and though very common is not less used by women of the higher rank as an ornament to their hair. 37. *C. indorum*. Lour. Cochinch. 166. "Stem twining, cork-barked, and chinked towards the bottom; leaves ovate-acuminate; peduncles subdivided." *Root* perennial. *Stem* long, branched. *Leaves* smooth, opposite. *Flowers* numerous, small, yellow, scentless; peduncles short, axillary; corolla rather salver-shaped; segments linear, longer than the tube, spreading; stigma large, sessile, ovate-oblong. *Follicles* oblong, acuminate, downy, curved inwards. A native of Cochinchina. 38. *C. erectum*. Linn. Sp. 5. Mart. 14. Lam. 9. Willd. 25. Jacq. Hort. 1. tab. 38. Misc. 1. 20. tab. 2. fig. 1. (*Apocynum folio subrotundo*; Bauh. Pin. 302. Tourn. 92. A. 1. latifolium. Clus. Hist. 1. 124.) "Stem erect, divaricated; leaves cordate, smooth." *Root* perennial. *Stems* several, about three feet high, slender, somewhat branched. *Leaves* opposite, petioled, ending in a point, inclining to glaucous. *Flowers* small, white; in lateral, lax, branched corymbs; calyx green, small, ciliated, five-cleft; segments lanceolate, acute, erect; corolla white, divided almost to the base into five, oblong, obtuse, flat segments, forming at the bottom an almost bell-shaped corolla, but spreading much at the top; nectary a sheath placed immediately on the pedicel of the flower, cylindrical, green, two-grooved near the bottom; putting out from the back, about the level of the germ, five, small, white, petal-shaped, somewhat linear, upright leaflets; dividing afterwards into five oblong, concave, yellowish segments, ending in a roundish scale, applied to the stigma, and about half its length, not furnished with two-celled bags, but having instead of them two roundish, yellow, small plates, situated above the base in a parallel position, and extended forward; germens two, obtuse, pale; style very short, thick, single, and undivided, common to both germens; stigma very large, elongate-conical, thick, erect, pale yellow, bifid and obtuse at the end, very long; anther-glands five, at the sides of the stigma about the middle, from each of which protrudes a pair of yellow, obovate, flat, pollen masses, almost without pedicels, hanging forward between adjoining plates of the nectary. A native of Syria. 39. *C. arborcum*, Lam.* Forsk. Egypt. 53. n. 80. "Stem twining; corolla rotate." A lofty tree, not milky. *Flowers* green. A native of Egypt.

C. vomitoria; Lam. See ASCLEPIAS *Asthmatica*.

Propagation and Culture.—*C. acutum* and *C. monspeliacum*, being natives of the south of Europe, are hardy, and propagate too fast by their creeping roots; they may be transplanted any time after the stems decay, till they begin to shoot in the spring. *C. erectum* and *C. suberosum* will live in the open air in England, if planted in a dry soil and warm situation. The former may be increased by parting the roots in the spring; the latter by laying down the

young shoots about Midsummer, which may be transplanted in the autumn. The natives of the Cape must be preserved in the dry stove, and may be increased by layers, cuttings, &c. Those of the tropical climates require a bark stove all the year, and must be allowed only a little water in winter; they may be propagated by laying down the young shoots, which, in three or four months, may be transplanted into pots filled with light sandy earth, and plunged into the tan-bed.

CYNANTHEMUM, a name given by some authors to the ANTHEMIS *Cotula*, or stinking May-weed. Ger. Emac. Ind. 2.

CYNANTHROPIA, from *κυνν*, *dog*, and *ανθρωπος*, *man*, a term used for madness given by a dog, wherein the patient avoids light, or any thing bright, fears water, and trembles at the sight and remembrance of it. It proceeds usually from a poisonous bite, or the like, of some mad creature, as a dog, a wolf, &c.

CYNAPIUM, in *Botany*. See ÆTHUSA.

CYNARA, (according to Linnæus, from *κυνν*, *canis*; but the derivation is altogether uncertain. The French botanists spell it cinara, as it is found in some Latin authors.) Linn. Gen. 928. Schreb. 1257. Willd. 1436. Juss. 173. Vent. 2. 498. Class and order, *syngenesia polygama equalis*. Nat. Ord. *Compositæ capitatæ*; Linn. *Cinarocephalæ*; Juss.

Gen. Ch. *Cal.* common, very large, dilated towards the base, imbricated; scales numerous, large, fleshy at the base, ending in a more or less prickly point. *Cor.* Florets all perfect, nearly equal, funnel-shaped; tube very slender; border erect, ovate, five-cleft; divisions linear, one of them more deeply separated. *Stam.* Filaments five, capillary, very short; anthers united into a tubular cylinder, the length of the floret, five-toothed. *Pist.* Germ somewhat ovate; style filiform, longer than the stamens; stigma simple, oblong, emarginate. *Peric.* The permanent common calyx a little converging. *Seeds* solitary, oblong-ovate, four-cornered, compressed; down sessile, long. *Recept.* bristly, more or less thick and fleshy.

Eff. Ch. Calyx dilated at the base, imbricated with somewhat fleshy scales; receptacle more or less thick and fleshy.

La Marck observes that this genus really differs from *carduus* only in the fleshiness of the scales of the calyx, and the thickness of the receptacle; since the emarginate termination of the scales with a point in the middle, though inserted by Linnæus, occurs only in the first species, and must therefore be excluded from the generic character.

Sp. 1. *C. scolymus*. Common artichoke. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 2. Blackw. tab. 458. Woodv. Med. Bot. tab. 199. (*C. sylvestris*; Park. Parad. tab. 519. fig. 4. Ger. 992. 3. emac. 1153. 3.) "Leaves somewhat spinous, pinnated and undivided; calyx-scales ovate." β Mill. Dict. 1. French artichoke. *C. hortensis aculeata*; Bauh. Pin. 383. *C. maxima alba*; Ger. 991. emac. 1153. 2. *C. patula*; Par. parad. tab. 519. fig. 3. γ . *C. hortensis*; Mill. Dict. 2. Globe artichoke. *C. hort. foliis non aculeatis*; Bauh. Pin. 383. *C. maxima anglica*; Ger. 991. fig. 1. emac. 1153. 1; Bauh. Pin. 383. *C. fativa rubra et alba*; Par. parad. tab. 519. fig. 1. 2. *Root* perennial, large, fibrous. *Stem* from three to six feet high, thick, strong, striated, somewhat branched. *Root-leaves* from two to four feet long, petioled, irregularly pinnatifid, deeply cut, more or less spinous; ash-coloured, smooth and veined above, hoary, downy and reticulated underneath. *Stem-leaves* simple, serrated or jagged, sometimes almost quite entire.

entire. *Flowers* terminating the stem and branches, on thick fleshy peduncles; common calyx globular, three or four inches in diameter; scales thick and fleshy at the base; tough, membranous, and shining above; deeply and widely notched at the tip, with a strong point between the segments; florets purple or blue. A native of the south of Europe. In its wild state it is said to be taller, more downy, and more spinous, than it appears in our kitchen gardens, but to have smaller heads. It has long been cultivated in almost every part of Europe; but in England, at least, rather as a luxury than as a profitable esculent. With us the heads, in their immature state and before the flowers open, are boiled in salted water, till all such parts of them are soft as are capable of becoming so. The scales of the calyx are then plucked off one by one, the lower part of them dipped in a mixture of melted butter and pepper, and the fleshy substance sucked from the rest. But there is generally so little to be obtained, as almost to justify the observation of a raw country servant, who having waited at supper when artichokes made one of the dishes, was eager, on his return into the kitchen, to taste a kind of food which he had never seen before; but, to his great disappointment, finding little more than a kind of horny substance, which equally defied his tongue and his teeth, declared with great *naïveté*, that gentlefolks seemed to him to have strange fancies, for as far as he could discover, one leaf would do as well to lick up the butter as a thousand. It was fortunate for him that he did not encounter what is emphatically styled by Englishmen the choke, from a not ill-founded persuasion that any unlucky wight who should happen to get it into his throat would certainly be choked. This consists of the unopened florets and bristles which stand upon the receptacle of the compound flower, and must be carefully cleared away before the epicure can arrive at the receptacle itself, the *bottom*, as we call it, or *le cul*, as it is more elegantly termed by our polished and refined neighbours on the other side of the channel, which is undeniably the most plentiful, as well as the most delicate part of the viand. On the continent, artichokes are more generally used, and are also eaten raw with salt and pepper. It is moreover esteemed a branch of good housewifery, to preserve them as a valuable part of the family winter-store.

For this purpose various methods have been devised; but the best is said by Parmentier to be that which is practised at Laon and in its neighbourhood. The heads are first half boiled and stripped of the calyx-leaves and the choke; the bottoms while they are still warm, are then plunged into cold water, which gives them a consistence, or as it is there expressed, *blanches* them. They are afterwards laid upon flat pieces of wicker work, and put four times successively into an oven in which bread has been baked, where they are kept till it has gradually cooled. By this process they become thin, hard, and transparent as horn, and do not resume their primitive appearance till they have been steeped in warm water. When they are once thoroughly dried in the oven, nothing farther is necessary than to keep them in a dry place, that that they may not grow mouldy. To obtain a pound of these preserved bottoms about forty heads of a moderate size must be expended.

Mr. Miller has mentioned two kinds, which he thought distinct species, but which appear to be only permanent varieties. 1. *C. Scolymus*, the green or French artichoke. 2. *C. hortensis*, the globe artichoke. The first has the scales of the calyx remarkably open; its head draws up rather to a point in the middle; the leaves are larger, much wider, of a paler colour, and inclining to yellow on the under surface

terminated by short spines; the bottoms are not so thick of flesh, and have a perfumed taste, which is not generally agreeable, so that it is not much cultivated by our gardeners. The second, which is our common artichoke, has its calyx-leaves turned inwards at the top, and its head rather flat; its leaves are of a bluer cast, and are more deeply cut, with no, or only small and scarcely perceptible prickles. John Bauhin had long before observed that the presence or absence, the abundance or the rarity of spines are merely characters of seminal varieties which are often produced indiscriminately from the same seeds. In France, where artichokes are in more general use, there is a greater number of varieties. Parmentier mentions five principal ones. 1. The white, distinguished by the strong spines of its calyx leaves, is the earliest and the smallest kind; but as it is also the most tender, and is with difficulty kept alive through the winter in the most favourable situation and soil, it is but little propagated. 2. The green, which is most in request in the French green markets, grows to a great size. Its form is more flat, and its scales more open than in the other varieties; its bottom is sometimes five inches in diameter, and the flesh very tender and well tasted, when it has been boiled in a good deal of water. 3. The violet, which has a more pointed head than the preceding, and scales with a small sharp spine, and a tinge of violet at their extremity, is as good and as tender as the green, but being smaller, is not so profitable to the grower. The French artichoke of Miller seems to be an intermediate variety of these two. 4. The red, which has entirely a red-purple exterior, with a yellow and more delicate flesh than any of the former kinds. It is always eaten raw, and that only when it is very young, as it soon becomes hard and stringy. 5. The sugary artichoke of Genoa, so called from its remarkably sweet taste. It is eaten raw like the red, and is even thought more delicate, but as it degenerates in the second year, and must therefore be annually renewed by fresh sets brought from Genoa, it is found in but few of the French gardens.

This species has obtained a place in the *Materia Medica*, and has been recommended for its diuretic qualities, but is now little used. The whole plant has a strong bitter taste and a peculiar smell. The flowers are used to curdle milk, and have lately been found to possess so much of the tanning principle as not to be inferior to white galls. 2. *C. horrida*. Aiton. Hort. Kew. 3. 148. Mart. 2. Willd. 3. "Leaves pinnatifid, downy underneath, spinous; spines at the base of the leaves, and of the pinnæ connate at the base." Found by Masson in the island of Porto Santo, near Madeira; and introduced at Kew in 1778. 3. *C. cardunculus*. Cardoon, Linn. Sp. Pl. 2. Mart. 3. Willd. 4. (*C. sylvestris* β . Lam. *C. spinosa*, cujus pediculi, esitantur; Bauh. Pin. 385.) "Leaves spinous; all pinnatifid; calyx-scales ovate." J. Bauhin asserts that this is either a hybrid plant, or a seminal variety of the first species. La Marek makes it a variety of his *sylvestris*, to which he refers Caspar. Bauhin's *C. sylvestris latifolia*, quoted by Linnæus and other authors as a synonym to *C. scolymus*. He gives the following description of the wild plant, which he says is a native of the south of France, Spain, Italy, and Sicily. "Very spinous; leaves somewhat hoary, finely cut; spines long, flavescens." *Stem* four or five feet high, upright, thick, cottony, a little branched, spinous near the top by means of the upper leaves, which are slightly decurrent and very spinous at the base. *Leaves* large, winged; pinnules decurrent; narrower than those of the first species, furnished with a long yellowish spire at the extremity of each segment, pale green above, very white and cottony underneath. *Flowers* blue, terminal, smaller than those of the common artichoke; calyx-scales somewhat fleshy,

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fleshy, terminated by a very sharp and rather long spine. It is much cultivated for the table in many parts of the continent, but is not much esteemed in England, and not often raised. The roots, and the stalks with the midribs of the leaves are the only parts that are eaten, and chiefly the latter, which are thick and crisp, and though naturally bitter, are rendered mild and pleasant by being blanched like celery. They are eaten either alone, or as a sauce to animal food, and especially roast meat, and are often introduced as a dish in the second course. But the cultivation of them is so troublesome, and after all so much depends upon the skill of the cook to render them very palatable, that they are almost confined to the upper ranks. In France the flowers carefully dried in the shade, are used by the country people as well as those of the common artichoke, to coagulate milk for the purpose of making cheese. 4. *C. integrifolia*. Mart. 6. Willd. 1. Vahl. Symb. 1. Vahl. Symb. 1. 68. "Leaves lanceolate, finely toothed; calyx scales lanceolate-acuminate." A low smooth plant with a simple, striated stem. Leaves an inch and half long, petioled, mucronate, toothed with remote small spines. Flower blue, terminal, solitary, peduncled, only half the size of that of *C. scolymus*; lower calyx-scales terminated by a weak spine. A native of the mountains near Toledo in New Castile. 5. *C. humilis*. Linn. Sp. Pl. 3. Mart. 4. Lam. 3. Willd. 5. Desfont. Atl. 2. 248. (*C. sylvestris bœtica*; Clus. Curf. 35. *Carduus tingitanus*; Pluk. Alm. 85. tab. 81. fig. 2. *C. humilis tingitanus*; Morif. Hist. 3. 158. § 7. tab. 33. fig. 9.) "Leaves spinous, pinnatifid, downy underneath; calyx-scales awl-shaped." β. *Carduus andelusiacus*; Pluk. Alm. 85. tab. 19? Lower leaves a foot long or more, three or four inches broad, stretched on the ground, cut on each side to the midrib into pinnatifid, rather narrow, pointed pinnules, with each of their segments ending in a short spine. Stem erect, scarcely longer than the root-leaves. Flower terminal, large, blue; calyx-scales oval-lanceolate, terminated by a sharp point. A native of Spain and Barbary. 6. *C. acaulis*. Linn. Sp. Pl. 4. Mart. 5. Lam. 4. Willd. 6. Desfont. Atl. 2. 249. tab. 223. Lam. Ill. Pl. 663. fig. 2. (*C. acaulos tunetana fasga-dicta*; Til. Pis. 41. tab. 20. *C. orientalis moschata*; Tourn. Cor. 51.) "Stemless; leaves pinnated, without spines, smooth above." Linn. "Stemless; leaves without spines, downy underneath, pinnatifid; segments incise-toothed; calyx-scales lanceolate, scarious and toothed at the tip. Willd. A native of the coast of Barbary near Tunis, and of the Levant. Obs. Jussieu has observed that *C. humilis*, having a radical flower, and calyx-scales not spinous, but ciliate-palmate at the tip, like the jaceæ, ought to be referred to another genus. But did he not mean this species? 7. *C. glomerata*. Willd. 7. Thunb. Prod. 141. "Stemless; leaves pinnatifid, spinous." A native of the Cape of Good Hope. 8. *C. pygmaea*. Willd. 8. "Stemless; leaves pinnated, nearly smooth; segments toothed, spinous; inner calyx-scales scarious at the tip." Leaves an inch and half or two inches long, green on both sides, unequally pinnated, bristly on the midrib. Flowers an inch and half long, sessile; calyx cylindrical; outer scales ovate, toothed at the tip; teeth terminated by a spine; inner ones ovate, quite entire, furnished with a single spine at the tip; innermost oblong, scarious and without a spine at the tip. A native of Spain.

CYNARA, in Gardening, comprehends plants of the hardy perennial and biennial kinds; of which the species cultivated are, the common artichoke (*C. scolymus*); and the cardoon-artichoke, or cardoon, (*C. cardunculus*).

Method of Culture.—These different plants are increased without much difficulty, if proper care be taken to preserve

them from the frosts in winter season, by some protecting material.

Method of Culture in the Artichoke Kind.—These are a sort of plants which succeed best in a soil of the light, deep, friable, loamy kind, well enriched by stable dung, or some other manure. Where the soil is stiff and wet, they are liable to be destroyed in the winter season by the stagnation of moisture about their roots.

Their propagation is most commonly effected by planting the offsets, or suckers produced from the old stools or roots, in the early spring months, as about the latter end of March, in an open situation, in rows four or five feet apart, and the same distances in the rows. The ground should be previously prepared by trenching in the dung to a good spade's depth or more.

In the business of planting out the offsets, after being separated from the old plants, they should be trimmed in their leaves and other parts, and be then put in by means of a line and dibble to the depth of three or four inches. Some plant two or three plants in one place, but others only one. The latter is probably the better method, as the plants spread very much. Whichever mode is practised, the earth should be well clofed about the sets, and a good watering immediately given, especially if the weather be dry; repeating it as there may be occasion afterwards.

After this they only require to be kept free from weeds during the summer, which is best performed by hoeing between the rows with a large sharp hoe; and to be protected from frost in the winter months.

Whenever large heads are wanted, all the small lateral ones should be removed as soon as they are formed to any size. In some situations, the small lateral crooked heads are, however, held in much esteem, consequently must not be rubbed off. The maturity of the heads of the artichoke is shewn by the plates or scales separating from each other considerably, and appearing of a brownish call.

In separating or cutting the heads, six inches of the stem should be preserved to them, and in many cases, when for market, a foot or more. And care should be taken, that as the heads are cut, the stalks be broken down to the bottom and removed, in order to promote the growth of new suckers for offsets.

With the view of protecting the plants during the winter from being injured by frost, it is the practice of some gardeners to earth or mould up the rows of the plants, so as to cover their crowns, forming the earth into a ridge. This is usually done about the latter end of November, or beginning of the following month, the lower leaves being cut and removed before the work is attempted. The author of the "Scotch Forcing Gardener," however, instead of ridging up the plants, advises that they should be carefully covered with stable-dung or other litter in the beginning of winter, which he considers as much better than digging trenches and moulding up with the earth from them, as the roots in that way are, he supposes, doubly exposed. Many instances have occurred where the plants managed in that method have been destroyed, while those well covered by litter have not sustained the least injury.

About the middle of March, or beginning of the following month, when the plants have begun to shoot, the ridges where that method has been employed, should be levelled down, removing all the unnecessary shoots, only leaving one or two on each plant. This work should be performed when the weather is dry, and the mould be well cleared and removed from the crowns of the plants.

But where they have been covered with litter, the coarse parts should be removed about the same time, and the more reduced.

reduced and rotten parts dug in; previously removing the shoots, as in the former case, to prevent their being too much crowded and producing small imperfect heads.

This is a sort of culture which must be repeated every year, for the old roots or stools, which should not be suffered to continue more than seven or eight years in the same situation, as they then begin to produce heads that are smaller in size; and where successions of this sort of crop are wanted, a few of the best offsets should be planted every year as soon as possible, after being taken off, in the manner that has been directed above. This practice not only keeps up the stock of plants, but continues the season of having the produce, as the young plants afford their heads much later than the old ones.

When it is necessary that the offsets should be conveyed to a distance, they should be carefully packed, eight or ten together, when dry, and bound round with a hay-band, the whole being then placed in a hamper or mat. In this case, some advise moistening the roots before planting them out in the garden.

The globular-headed sort is, in general, found the largest and most fleshy, but the green conical-headed the most hardy, and best capable of resisting the effects of severe seasons.

Method of Culture in the Cardoon Kind.—This is readily accomplished, in this sort of plants, by sowing the seeds in the latter end of April or beginning of May, or later, in the places where the plants are to remain. It is best done by forming trenches at the distance of about five feet from each other, in the manner directed for celery, to the depth of a good spade, placing the mould on the sides or interspaces; then to point in with a spade a little well-rotted compost manure in the bottoms, and make a small drill in the centre, to the depth of an inch, dropping in the seeds two or three inches apart, covering them with the fine mould: a little water should be given at the same time, when the season is dry and hot.

When the young plants have advanced two or three inches in their growth, they should be thinned out to the distance of ten or twelve inches, and gradually to much greater distances. And as they proceed in their growth, they should be gradually moulded up when dry, in order to be blanched and rendered tender, in the same manner as practised for celery; only the leaves being carefully gathered, and tied together each time with a little old matting, in order to prevent the mould from getting between them and causing their decay.

It is likewise the practice with some gardeners to raise the plants on beds, and afterwards transplant them into drills, or holes, where they are to remain and be earthed up for blanching; but it is probable that the former is, in most cases, the preferable practice.

With the view of having a longer succession of these plants, the moulding up should be performed at different times, from about the beginning of September, at the distance of a fortnight or three weeks.

These plants are found to succeed best on such soils as are of the more deep sandy loam kinds, which have not been much enriched by manure from long cultivation.

With the view of saving seed, some of the best plants should be suffered to remain without being blanched, and be protected by litter during the winter; and in the spring they will shoot up into flower, and produce ripe seed in the autumn, which should be carefully preserved.

The fleshy parts and roots of the cardoon are capable of being preserved in the winter season, in the same manner as

the carrot, celery, and other similar plants, which have large thick roots.

CYNARA, in *Ancient Geography*, a name given by Pliny to an island of the Ægean sea.

CYNCHRAMUS, in *Ornithology*, a name given by Al-drovand and Brisson to the *EMBERIZA Miliaria*, which see.

CYNDONIS, a river of the Hellespont. Hesychius.—Also, a river of Greece, in the Peloponnesus.

CYNEAS, or CINEAS, in *Biography*, a minister of Pyrrhus, king of Epirus, more distinguished by his talents than by birth. He had been instructed in oratory by Demosthenes, and in military tactics by the most celebrated officers in Alexander's army. So remarkable was he for the arts of persuasion that his sovereign used to compliment him with having gained more towns by his eloquence, than he could ever have conquered by force of arms. He was indeed an enemy to war, as the curse of mankind, when undertaken for the gratification of ambitious projects: he was of the Epicurean sect, and was perpetually urging upon the mind of his king the maxim, "That no addition to his territory; no augmentation of his power, could add one ingredient to the happiness already within his reach." Pyrrhus, however, was a warrior and a king, and not a philosopher; he determined on conquest, and forced upon his minister a chief command. After a decisive victory over the Romans in the year B. C. 280, Cyneas proposed to negotiate, the king consented, and sent him to Rome for the purpose. In this he was unsuccessful, and on his return, he told Pyrrhus that the Roman senate seemed to him an assembly of kings. Cyneas made a second attempt but with no better success than before. He was afterwards dispatched to Sicily, and prepared the way for his master's reception in that island. From this period no more is heard of Cyneas: he is recorded by Pliny and others as a most extraordinary instance of the powers of memory: he is said to have been able, the day after his arrival in Rome, to salute all the senators and knights by their names. As an author, he is mentioned by Cicero, as having in conjunction with the king, his master, composed a treatise on the military art. He abridged also the "Tactics" of Æneas. Univer. Hist. Moreri.

CYNEBOTE, the same with Cenegild.

CYNEGETICA, in *Ancient Geography*, a name given by the Greeks to a mountain of Africa, on the straits of Hercules, opposite to that of Europe; and both together were called the *Columns of Hercules*.

CYNEGETICS, from κυνηγετης, *hunter*, of κυνη, *dog*, and αγω, *I lead out*, books treating of the art of hunting. Gratus Faliscus has written a *Cynegetica* with applause.

CYNEGICA REGIO, in *Ancient Geography*, a country of Asia, in Syria, placed near the town of Antioch.

CYNESII, a people of Iberia, or Spain, called also *Cynete*; supposed to be that part of Lusitania which is now denominated Algarve.

CYNETIA, a town of the Peloponnesus in the Argolide.

CYNETICUM JUGUM, a mountain of Spain on the coast of the Mediterranean sea, and near the river Ana.

CYNIA, a town of Epirus, in Acarnania. Strabo.

CYNICS, a sect of ancient philosophers, who valued themselves on their contempt of every thing, especially riches and state, arts and sciences; all excepting morality.

The founder of this sect is said to have been Antisthenes, a disciple of Socrates; who, after his master's death, quitting the Pyreum, retired to Cynofarges, a kind of academy not far from the gates of Athens. See ANTISTHENES.

Hence, some will have it, came the name κυνικος, *cynicus*, viz. from *cynofarges*. But others, with more probability, derive

CYNICS.

derive it from *κυνν*, *dog*, because of their severity and importunity in reprehending vice. Thus Aristotle observes, *ὅτι δὲ κύνικος*, &c. *the Cynics were so called from their free way of rebuking, &c.* Hence Diogenes the Cynic said of himself, *I bite the evil*; and Antisthenes himself was called *ἀπλὸς κύνν*, *an ingenious and sincere dog*: it being the distinguished character of the Cynics to attack and bark at the ill, and to defend and fawn on the good.

Arrian very much extols the Cynical genius: "A Cynic (says he) is a messenger sent from Jupiter to overlook human affairs; a public doctor, and tutor of mankind; who instructs and chastises at the same time; an Æsculapius; a lord and king, adorned with a sceptre and diadem, who governs the people; and this voluntarily, without trembling, without guards, &c. but by a good conscience." The ground of this encomium may be owing, in some measure, to the affinity between the *Stoics* and *Cynics*: the chief difference between them consisted in this, that the former were more modest and reserved than the latter; who were said to have banished all shame, and were able to practise any obscenity without blushing.

Hence Laertius observes of Diogenes, that he did every thing openly, whether it belonged to Ceres or to Venus: though the same Laertius adds, that he did it in imitation of the choridifascali, *i. e.* he only ran to an excess of impudence, to put others out of conceit with it.

The sect of the Cynics is to be regarded more as an institution of manners than as a school of philosophy: as it was formed rather for the purpose of providing a remedy for the moral disorders of luxury, ambition, and avarice, than with a view to establish any new theory of speculative opinions. Antisthenes, and the other leaders of this sect, were considered by their disciples not so much as the authors of a new doctrine, as inflexible patterns of virtue, and rather as examples for their imitation in the conduct of life, than as preceptors to guide them in the search after truth. The sole end of the Cynic philosophy was to subdue the passions and produce simplicity of manners: and the characteristic peculiarities of the sect were an indignant contempt of effeminate vices, and a vigorous adherence to the rules of moral discipline. According to the original spirit of the sect, a Cynic was one who appeared in a coarse garb, and carried a wallet and staff, as external symbols of severity, and who regarded every thing with indifference, except that kind of virtue which consists in a haughty contempt of external good, and a hardy endurance of external ill. Simplicity and moderation were, indeed, in this sect, carried to the extreme of austerity, and at last produced the stoical system of apathy: but the real design of both these sects seem to have been to establish virtuous manners. The vigorous discipline of the Cynics, which had for its primary object the laudable purpose of exhibiting an example of moderation and virtuous self-command, degenerated by degrees into the most absurd severity: but candour will suggest an apology for the errors of this extreme. In order to be at perfect liberty to apply themselves to the cultivation of virtuous habits and manners without interruption from the noisy contents of speculative philosophy; the Cynics renounced every kind of scientific pursuit: accordingly they discarded all dialectic, physical, and mathematical speculations, and confined themselves to the study, or rather to the practice, of virtue. In this respect they formed themselves upon the model of Socrates: and it may be pleaded in their excuse, that the learning which chiefly prevailed in Greece at that time consisted very much in futile speculations and an illegitimate kind of eloquence, which contributed little towards the happiness of society, or the real improvement of the human mind. As an apo-

logy for the singularities of this sect, it may be further alleged, that the manners of the Greeks were at this time verging much towards the extreme of effeminacy. Luxury and vanity infected even the philosophers, as we may justly infer from the accounts that are transmitted to us concerning the dress and manners of Aristippus, Arcefilaus, Aristotle, Stilpo, and others. Socrates made an attempt to correct the public taste; and Antisthenes, without possessing his judgment and moderation, adopted the same plan, but pursued it to an extreme that passed beyond the limits of decorum. Regarding attention to external appearance as unfavourable to virtue, he deviated into the simplicity of nature farther than was consistent with the decorum of civilized life. His followers, seduced by his example, and by the reputation and influence which he acquired, as a pattern of wisdom and fortitude, adopted his peculiarities and carried them to a ridiculous and absurd extreme. Thus the Cynic philosopher, being at first merely a severe public monitor:—

"Virtutis vere custos, rigidusque fasces—"

Hor. ep. i. 1. 17.

"The stern defender of pure virtue's cause—"

commanded attention and respect; but when, in process of time, the freedom of censure degenerated into scurrility, the boldness of the philosophers was admired by the vulgar, but their imprudence excited the wonder of the more judicious: and the whole order gradually sunk into disesteem and contempt. Hence we may account for the disgraceful tales which have been industriously propagated concerning this sect; inasmuch, that the singularity of the early Cynics, and their gross violations of decorum, rendered the sect, at a later period, not only ridiculous but infamous, and furnished occasion for those, who did not properly distinguish between the first design of this institution and its subsequent abuses, to declaim against the Cynical philosophy in general, as a compound of vulgarity, spleen, and malignity.

The sum of the moral doctrine of Antisthenes, and the Cynic sect, is this: virtue alone is a sufficient foundation for a happy life. Virtue consists, not in a vain ostentation of learning, or an idle display of words, but in a steady course of right conduct. Wisdom and virtue are the same. A wise man will always be contented with his condition, and will live rather according to the precepts of virtue, than according to the laws or customs of his country. Wisdom is a secure and impregnable fortress: virtue, armour which cannot be taken away. Whatever is honourable is good; whatever is disgraceful is evil. Virtue is the only bond of friendship. It is better to associate with a few good men against a vicious multitude, than to join the vicious, however numerous, against the good. The love of pleasure is a temporary madness." Laertius, Julian. Orat. Maxim. Tyr. Diss. Arrian. Diss. Epict. Fabr. Bib. Grec. v. ii. Brucker's Hist. Philos. by Enfield, vol. i.

CYNIC Period. See *Egyptian Year*.

CYNIC Spasm, spasms CYNICUS, a sort of convulsion, whereby the patient is brought to imitate the gestures, snarlings, howlings, &c. of a dog. See SPASM.

Dr. Freind, in the Philosophical Transactions, gives us an account of a very extraordinary *spasmus* of this kind, wherewith two families, at Blackthorn in Oxfordshire, were seized.

The novelty of the thing drew abundance of visitors to the village, and among the rest Dr. Willis; who, a good while before he reached the place, heard a terrible noise of barking and howling: upon his entering the house, he was immediately saluted by five girls, bawling, and answering each other by turns, with violent motions of the head. In

their face there was no convulsion seen, beside cyclic dilations, and oscillations of the mouth: their pulse was pretty regular; their noise was rather like that of the howling, than of the barking of dogs; though its returns were more frequent, with deep sighings between.

The *spasmus* had seized all equally: whereof the youngest was but six, and the eldest fifteen years of age: at intervals they had their reason and senses entire; but not long before one of them, returning to her ye'ling, set on the rest: till at length, all fainting, they fell like epileptics on a bed laid in the middle of the room to receive them.

A little while they would lie quietly and decently together; but upon a new orgasm of the spirits, they began to heat and bruise each other. Two of the youngest awaked while the doctor slayed, and list their sisters on the bed: but the *spasmus* soon had hold on them again.

In July 1700, Dr. Friend visited another family, in the same village; where one boy and three girls had been seized ten weeks, without any apparent preceding cause. A girl had had it first; and the rest, as the mother informed him, were so struck with their sister's disorder, that they too were seized. At his arrival, they were all at play, very briskly, and unconcernedly, before the doors; at length the eldest girl, about fourteen years of age, was seized as usual.

The only symptom of its approach, was a swelling of the stomach; which rising gradually up to the throat, set the muscles of the larynx and the head upon their usual convulsions: this rising was a certain symptom of an approaching paroxysm in them all; and if they endeavoured to stop it, it burst out with the greater violence, and held the longer.

The noise they made was incessant, and disagreeable; yet not so much like the barking or howling of dogs, as had been given out, as a quaint kind of a song, consisting of three notes, or tones, repeated twice over; and closed by deep sighs, &c. accompanied with extraordinary gestures and nutations of the head.

This disease the doctor takes to be natural; and to rise from the common cause of all convulsions, viz. from the animal spirits growing unruly in the nerves, and driving the muscles into various contractions, according to the circumstances of the indispotion.

CYNIPS, in *Entomology*, a genus of hymenoptera in the Linnæan system, and of the piezata in that of Fabricius. The mouth is furnished with a short unidentate membranaceous jaw, the mandibles vaulted, horny and cleft, and the lip entire; feelers four, short, unequal, and capitated; antennæ moniliform; sting spiral, and often concealed within the body. The Fabrician character consists in having four unequal and somewhat capitated feelers, the lip horny and entire, and the antennæ moniliform.

Many of the excrescences found on the leaves, stems, branches, and roots of trees, are occasioned by the puncture of these insects; their larvæ are soft, without feet, of a cylindrical form, and inhabit within the gall, where they subsist on the juices of the tree; the pupa differs from the complete insect only in being destitute of wings, but the rudiments of the wings are perceptible even in this state of the creature. Most of the species appear to be peculiar to certain plants; the oak and willow in particular are much infested with insects of this kind.

Species.

ADSCENDENS. Brassy; abdomen petiolate, conic and ascending. Fabr.

The largest species in this genus, and is found in Saxony.

The antennæ are short and black; scutal pointed; legs pale, thighs black at the base.

ROSÆ. Black; abdomen ferruginous, black behind; legs ferruginous. Linn.

Inhabits the rosa hispida in Europe.

COMPRESSA. Glossy-black; abdomen compressed; shanks ferruginous. Fabr. Append. Native of Italy.

GLECHOMÆ. Fuscous; thorax villous. Fabr. *Cynips glechomæ hederaceæ*, Linn.

Inhabits Europe, and forms rough globular galls on the glechoma hederacea.

QUERCUS BACCARUM. Black, base of the antennæ and legs yellowish. Linn.

Forms roundish pellucid galls about the size of a pea on the under surface of the oak leaves. Found in Sweden, France, and other parts of Europe.

QUERCUS FOLII. Black; thorax lineated; legs grey; thighs beneath black. Linn. *Diplolepis fuscus*, Geoffr.

This species forms galls about the size of a nut on the under surface of the leaves of the oak.

QUERCUS INFERUS. Deep black; antennæ and legs pale. Linn.

Forms globular opaque red galls on the under surface of the leaves of the oak.

QUERCUS PETIOLI. Black; legs white; thighs fuscous; Linn.

Forms convex galls on the footstalk of oak leaves.

QUERCUS PEDUNCULI. Grey; wings with a linear cross. Linn.

Occasions by its puncture the granulated connected galls on the male flowers of the oak.

QUERCUS RAMULI. Pale; abdomen and wings black. Linn.

QUERCUS TOJÆ. Grey; abdomen shining-ferruginous. Fabr.

One of the largest species of the genus, and is found in France on the quercus toja. Bosc.

FAGI. Deep black and without spots. Linn.

Forms pear-shaped galls on the under surface of the leaves of the beech.

VIMINALIS. Yellow; thorax black. Linn.

Forms galls on the leaves of the willow, salix viminalis.

CAPREAE. Green, and shining; legs pale. Linn.

Forms ferruginous galls, resembling grains of barley, on the leaves and branches of the willow.

SALICIS STROBILI. Deep black; thorax greenish on the back. Linn.

In the extremities of the branches of the salix glabra, which it dilates into a strobile-shaped excrescence.

AMERICANÆ. Black; legs pale. Linn.

Forms unequal galls at the ends of the branches of salix pentandria.

RUFICORNIS. Black; abdomen azure; antennæ rufous. Fabr.

Found in France by Bosc.

ACERIS. Body brown; thorax black, and longer than the abdomen. Gmel.

Forms glabrous subturbinated galls on the leaves of acer pseudoplatanus. Act. Boh.

MEGACEPHALA. Deep black; head large and retuse; abdomen truncated. Fabr.

A small species, found on rotten wood in Denmark.

ITALICA. Deep black and shining; thorax golden. Fabr. Native of Italy.

PSEVES. In protuberances of the *ficus carica*. Linn.
SYCOMORI. In protuberances of the *ficus sycomorus*.
 Hassel.

The body is black; the sting weak and exerted.

LONGIPENNIS. Black; abdomen compressed; wings long, white, and marked with two black dots. Fabr.

Inhabits France, and is found in a small flat gall. Bosc.

APTERA. Without wings, ferruginous with compressed abdomen marked with a broad black band.

A large species, found in France.

ROSMARINI. On the *rosmarinus chilensis*. Molin. Chili.

Forms white galls about the size of a nut, and of a globular form, which are full of clear oil, on the branches of *rosmarinus chilensis*.

ATERRIMA. Black, with raised dots; tarsi pale. Schrank.

Inhabits Austria, and forms a very large excrescence on the stems of plants.

RUBI. Silky green-gold punctured; bristles at the end of the tail shorter than the body. Schrank.

Forms protuberances on the stems and branches of the *rubus caesius*.

PHRAGMITIS. Black; base of the antennæ and legs testaceous; abdomen elongated into a broad projecting tail. Schrank.

Found in the inflated stalk of the *arundo phragmitis*.

LUGDUNEA. Black, spotted with yellow; posterior thighs globular, and dentated at the inner margin; flag triple, turned back over the abdomen. Tourette. Act. Par.

A large species, found on various plants.

TESTACEA. Testaceous; head and legs yellowish; eyes black. Gmel. Native of Europe.

NIGRA. Black; base of the abdomen and legs pale. Gmel. Inhabits Europe.

INANITA. Black; abdomen of one segment; the anterior part with a diaphanous spot each side; legs ferruginous. Gmel.

Size of *formica rufa*, and inhabits Upsal.

CYNNA, in *Ancient Geography*, a town of Asia, in the vicinity of Heraclea; the same with the episcopal town of *Ceniva*, placed by Hierocles in Galatia.

CYNO, a place of Egypt, in the Delta, between Tmuis and Tava, according to the Itinerary of Antonine.

CYNOCEPHALÆ, eminences of Greece, in Thesaly, before Scotussa, mentioned by Strabo; who adds, that the Romans under the command of T. Quintius Flaminius, gained here a victory.—Also, the most western promontory of the isle of Corcyra or Corfu.

CYNOCEPHALI, a section of the simia, with short tail, including the baboons. See **SIMIA**.

CYNOCEPHALI, in *Mythology*, a kind of baboons, or animals with heads like dogs, which were wonderfully endowed and revered in many temples of Egypt. See **CUNOCEPHALI**.

CYNOCEPHALUS, in *Ichthyology*, a name given to some species of the *Squalus*, which see.

CYNOCRAMBE, in *Botany*, *Dioscoridis*; Bauh. pin. 122. *Alfines foliis*; Barrel. ic. 335. *Prostrata*; Gært. tab. 75. fig. 9. See **THELYGONUM**. *C. mas* and *fœmina*; Cam. epit. 999. See **MERCURIALIS perennis**.

CYNOCTONON. See **ACONITE**.

CYNODESMUS, or **CYNODESMION**, among *Anatomists*, the band, or ligament, which ties the prepuce of the yard to the nut or glans.

CYNODON, in *Ichthyology*, the name given to the *SPARUS Dentex*, which see.

VOZ. X.

CYNOGLOSSA, in *Botany*, *minor montana*. Col. Ephr. See **MYOSOTIS Lappala**.

CYNOGLOSSA montana media et maxima. See **CYNOGLOSSUM officinale et apenninum**.

CYNOGLOSSOIDES, Isard. See **BORAGO Indica et Africana**.

CYNOGLOSSUM (*κυνόγλωσσον*, from the shape of the leaves). Hounds-tongue. Linn. Gen. 183. Schreb. 243. Willd. 278. Tourn. cl. 2. § 4. gen. 9. Gært. 416. Juss. 131. Vent. 2. 393. Class and order, *pentandria monogynia*. Nat. Ord. *Asperifolia*, Linn. *Borraginea*, Juss.

Gen. Ch. *Cal.* Perianth one-leaved, inferior, with five divisions, permanent. *Cor.* monopetalous, funnel-shaped, the length of the calyx; tube cylindrical, shorter than the border, closed at the mouth by five convex, prominent, converging scales; border cleft half way down into five obtuse segments. *Stam.* Filaments five, very short, in the mouth of the tube; anthers roundish. *Pist.* Germs four; style awl-shaped, permanent. *Peric.* Nuts four, compressed or concave, attached to the style by their interior side.

Eff. Ch. Corolla funnel-shaped; the throat closed with arched scales. Nuts flat, attached to the style by their interior side.

Sp. 1. *C. officinale*. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Pluk. Ic. tab. 78. Curt. Lond. Fasc. 4. tab. 16. Eng. bot. 921. Woody. Med. Bot. Supp. tab. 216. Lam. Ill. Pl. 92. fig. 1 (*C. majus vulgare*; Bauh. pin. 257. Tourn. 139. Lob. ic. 580.) "Stamens shorter than the corolla; leaves broad-lanceolate, downy sessile." Root biennial, spindle-shaped, a little branched, with a blackish bark. Whole herb downy and soft to the touch, with a strong fetid smell resembling that of mice, or the urine of dogs. *Stem* about two feet high, erect, cylindrical, often furrowed, branched, leafy. *Leaves* scattered, entire, undulated, veined, of a dullish green colour, seven or eight inches long; lowermost petioled, upper ones half embracing the stem, almost heart-shaped. *Flowers* in recurved naked racemes, forming a panicle, small, dull purplish red; lobes of the corolla rounded; stigma acute. *Seeds* inversely ovate, attached by their points, rough with numerous hooked prickles. A native of England and most parts of Europe, by road sides and in waste places, chiefly in a calcareous soil. Like most plants of its natural family, it is mucilaginous, astringent and narcotic, and is supposed to be deleterious, when taken internally in any considerable quantity. A decoction of the roots taken inwardly, and cataplasms of them applied externally, have been recommended in stumous and serophalous cases; but no preparation of the plant is much used in the present practice.

2. *C. sylvaticum*. Smith Fl. Brit. 2. Jacq. Coll. 2. 77. Eng. Bot. 1642. (*C. officinale* γ Linn. Sp. Pl. β. Hudf. Fl. Aug. β. Willd. *C. montanum*; Lam. 2. *C. fœmper-virens*; Bauh. pin. 257. *C. folio virenti*; Rai. Syn. *C. montanum virenti folio flore minore*; Tourn. 140. *Cynoglossa montana media*; Colum. ephr. 176. tab. 15.) "Stamens shorter than the corolla; leaves lanceolate, somewhat spatulate, shining, nearly naked, rather scabrous, with small tubercles." Root annual or biennial. *Stem* about a foot and half high, but little branched, beset with loose hairs. *Leaves* green, not downy, roughish with short separate hairs; root ones petioled, a little nerved; stem ones sessile, oblong, rather distant. *Flowers* at first reddish, afterwards assuming a bluish hue. The whole plant is almost free from any fetid smell. A native of Switzerland, France, and some parts of England, especially Essex. 3. *C. pitum*. Ait. Hort. Kew. 1. 179. Mart. 10. Willd. 2. Vahl. Symb. 2. 34. (*C. amplexicaule*; Lam. Ill. 1794. *C. charifolium*;

CYNOGLOSSUM.

cherifolium; Jacq. Collect. 3. 30. Scop. Carn. n. 193. *C. creticum*; Vill. delph. 2. 457. *C. creticum* 2. Cluf. Hist. 2. 162. Bauh. Hist. 3. 600. *C. creticum latifolium fetidum*; Bauh. pin. 257. Tourn. 140. *C. flore cœruleo striis rubris*; Moris. Blas. 258. Hist. 3. 449). "Corollas about the length of the calyx; lobes roundish-dilated; leaves lanceolate, downy; upper ones cordate at the base." Ait. "Border of the corolla dilated, variegated; leaves oblong, embracing the stem, pubescent; upper ones somewhat cordate." Lam. *Root* perennial. Resembling *C. officinale* in habit and size. *Stems* a foot and a half high, more branched. *Leaves* shorter, softer, and more hoary. *Flowers* pale blue or purplish, beautifully pencilled with deeper coloured veins. A native of the south of Europe, Barbary, and Madeira. 4. *C. lanceolatum*. Mart. 11. Willd. 3. Vahl Symb. 2. 34. Forfk. Ægypt. 41. "Leaves lanceolate, attenuated at both ends, rugged, with pointed tubercles above; upper ones sessile." *Stem* herbaceous, upright, angular, rough with hairs, hoary at the top. A native of Ægypt and Arabia. 5. *C. virginicum*. Linn. Sp. Pl. 2. Mart. 2. Lam. 4. Willd. 4. (*C. amplexicaule*; Gron. virg. 19. Moris. Hist. 3. 449. § 11. tab. 30. fig. 9?) "Leaves spatulate-lanceolate, shining, three-nerved at the base; bracte of the peduncles embracing the stem." *Root* annual. *Stem* four feet high, erect, branched, covered with rough hairs. *Leaves* from three to four inches long, embracing the stem, gradually lessening at both ends, rough with hairs, shining on the upper surface. *Flowers* small, white, scattered, near the ends of the branches. A native of Virginia and other parts of North America. 6. *C. limense*. Willd. 5. Feuille. Peruv. 1. 71. tab. 49. "Leaves oblong, acuminate; sessile, smooth, a native of Lima. 7. *C. cherifolium*. Linn. Sp. Pl. 3. Mart. 3. Lam. 5. Willd. 6. (*C. creticum* 1. Cluf. Hist. 2. 162. *C. creticum*, argenteo angustifolio; Bauh. pin. 257.) "Corollas double the length of the calyx; leaves lanceolate." Linn. "Calyxes downy, shorter than the corolla; stamens included; leaves narrow-spatulate, very soft, tomentous-silky." Lam. *Root* biennial, spindle-shaped, and a little branched. *Stems* several, erect, pubescent, striated, leafy, branched. *Leaves* half embracing the stem, not rough with tubercles. *Flowers* in naked racemes, white with red, blue or purple veins. A native of the south of Europe. 8. *C. apenninum*. Linn. Sp. Pl. 4. Mart. 4. Lam. 3. Willd. 7. Gært. tab. 67. (*C. montanum maximum*; Tourn. 139. *Cynoglossia montana maxima*; Col. Eepr. 178. tab. 175. Rai. Hist. 490.) "Stamens equalling the corolla." Linn. "Stamens rather longer than the corolla; calyxes shaggy; root-leaves ovate, petioled, very large." *Root* biennial, stem two feet high or more, very thick, almost covered with leaves, which give it a pyramidal form. *Leaves* soft, pubescent, greenish white. *Flowers* in a terminal, branched panicle, at first dull red, afterwards bluish. Lam. *Nuts* four, with a leathery shell, fixed to a pyramidal receptacle, ovate-acuminate; flattish above, (depressed when old,) and muricated with small erect prickles; gibbous and scabrous with acute points underneath and at the sides; pale straw-coloured, one-celled. *Seed* large, inversely egg-shaped, beaked, umbilicated under the beak, brown. Gært. A native of the Apennines. 9. *C. hispidum*. Willd. 8. Thunb. prod. 34. "Leaves oblong, obtuse, rough with bristles; stamens shorter than the corolla." *Root* annual. 10. *C. kirjutum*. Willd. 9. Thunb. prod. 34. "Leaves lanceolate, shaggy; prickles of the seeds hooked." *Root* annual. 11. *C. echinatum*. Willd. 10. Thunb. prod. 34. "Leaves lanceolate, obtuse, covered with soft tubercles; seeds somewhat conical, beset with hooked prickles." *Root* perennial. 12. *C. muricatum*. Willd. 11. Thunb. prod. 34. "Leaves ovate, shaggy, scabrous; seeds callous-muricated." *Root* perenn. "The last four are natives of the Cape of Good Hope. 13. *C. angustifolium*. Willd. 12. (*C. emarginatum*; Lam. Ill. 1799. *C. orientale minus*, flore campanulato cœruleo; Tourn. Cor. 7.) "Leaves linear, bristly; style longer than the campanulate corolla; seeds even-surfaced." Willd. "Corolla longer than the calyx; border obtuse, emarginate; leaves narrow-lanceolate, shaggy." Lam. *Root* perennial. *Stem* half a foot high, erect, hairy. *Root-leaves* petioled, obtuse, hairy; stem ones sessile. *Flowers* in a naked, terminal, trichotomous raceme, blue. Willd. A native of Armenia. 14. *C. levigatum*. Mart. 5. Lam. 2. Willd. 13. Gært. tab. 67. fig. 4. Lam. Ill. Pl. 96. fig. 3. (*C. rindera*; Linn. jun. Supp. 130. *Rindera tetralps*; Pallas it. 1. 486. tab. 1. fig. 1, 2.) "Leaves lanceolate-ovate, smoothish; calyxes downy; seeds even-surfaced." *Root* perennial. *Stem* a foot high, erect, striated, paniced at the top. *Root-leaves* narrowed into a petiole, soft, smooth; stem ones small, sessile. *Flowers* white; calyx five-leaved; leaves linear; tube of the corolla the length of the calyx; anthers almost sessile, between the divisions of the border; style bristle-shaped; stigma globular, scarcely conspicuous. *Nuts* four, coriaceous membranous, shield-shaped on the outside; shield ovate, large, membranous at the edge, radiated with ferruginous lines; nut itself placed in the concave part of the shield, ovate-globular, acuminate at the top, marked in the middle with an oblong umbilical space, one-celled: receptacle tetragonous-awl-shaped, ending in the style. *Seeds* solitary, ovate, beaked, somewhat compressed, dark bay-coloured. A native of Siberia and the Levant. 15. *C. glaberrimum*, Willd. 14. (*C. orientale glaberrimum*; Tourn. Cor. 7.) "Leaves lanceolate, smooth, covered with soft tubercles underneath: seeds membranous, somewhat muricated in the centre." *Stem* erect, angular, smooth, branched; *Leaves* smooth, scabrous at the edge. *Flowers* in racemes; peduncles after flowering near two inches long. *Seeds* furnished with two or three solitary prickles at the centre. A native of Armenia. 16. *C. cristatum*. Lam. 7. Willd. 15. (*C. orientale buglossifolium*; Tourn. Cor. 7.) "Leaves linear-lanceolate, bristly; seeds membranous, muricated at the centre and on the margin." β. *C. fructu umbilicato*; Bauh. pin. 257. Tourn. 140. Rai. hist. 491. Moris. 5. 449. § 11. tab. 30. fig. 7. *Cynoglossia altera media*; Colum. Eepr. 1. 177. tab. 178. *Stem* a foot high or more, cylindrical, shaggy, leafy, with two or three branches near the top. *Leaves* sessile, attenuated at the base, rough with hairs proceeding from white callous points. *Flowers* in naked terminal racemes, small, red; calyx divided to the base, shaggy; corolla not larger than the calyx. *Nuts* toothed on the membranous edge. Found by Tournefort in the Levant. The variety has narrower, smoother leaves, and is a native of Italy. 17. *C. lusitanicum* Linn. Sp. Pl. 6. Mart. 6. Lam. 12. Willd. 16. (*Omphalodes lusitanica elatior*; Tourn. 140.) "Leaves cordate embracing the stem, smooth, even at the edge." Vahl. "Leaves lanceolate, nearly even-surfaced; racemes few-flowered, very short." Lam. Whole plant smooth. *Root* annual. *Stem* a foot high, erect, branched. *Leaves* glaucous green, obtuse, veinless. *Flowers* red or violet, remote, in naked terminal racemes; pedicels an inch long, spreading; calyx deeply cleft; segments lanceolate. A native of Portugal. 18. *C. linifolium* Linn. Sp. 5. Mart. 7. Lam. 13. Willd. 17. Gært. tab. 67. (*Omphalodes lusitanica lini folio*, smooth, toothed, scabrous at the edge." Vahl. "Leaves lanceolate," Tourn. *Linum umbilicatum*; Park. Theat. 1687. Barrel. c. 1234. *Cynoglossium minus album*; Moris. 3. 449. § 11. tab. 30. fig. 11.) "Leaves linear-lanceolate, glaucous, scabrous at the edge; racemes long, erect, somewhat paniced."

clad." Lam. *Root* annual. *Stems* a foot high, smooth, leafy, branched at the top. *Leaves* smooth above, rough, with short stiffish hairs at the edges and underneath. *Flowers* white, peduncled. *Nuts* four, small, incumbent on an awl-shaped receptacle which becomes incurved as the seeds ripen, somewhat membranous, compressed, ovate-acuminate, attenuated at the edge into a pellucid whitish membrane, deeply striated, with a large toothed hole at the top, whence this and some other species have been called navelwort. A native of Portugal. 19. *C. latatum*, Lam. 8. Willd. 18. (*C. orientale* flore roseo; Tourn. Cor. 7.) "Calyxes tomentous-woolly; border of the corolla with five deep acute divisions; racemes drooping." *Stem* a foot high, striated, pubescent towards the top, leafy, somewhat branched. *Root-leaves* seven or eight inches long, nine or ten lines broad, petioled, narrow-lanceolate, pubescent; stem ones small, oval-acute, embracing the stem. *Flowers* in short, clustered, woolly, terminal racemes; calyx pitcher-shaped, very woolly; style longer than the flower. A native of the Levant. 20. *C. japonicum*, Mart. 9. Lam. 9. Willd. 19. Thunb. Flor. jap. 81. "Leaves oblong, shaggy; stems prostrate." *Root* annual. *Stems* four or five, cylindrical, shaggy, decumbent, afterwards flexuose-erect, unequal, four or five inches long. *Leaves* embracing the stem, oblong, acute, finely serrated, shaggy on both sides, spreading. *Flowers* in a terminal raceme, purple. A native of Japan. 21. *C. lateriflorum*, Lam. 10. Ill. Pl. 92. fig. 2. Willd. 20. "Leaves linear, acute, narrow, hairy; flowers lateral, solitary, nearly sessile." A small shaggy plant, of a whitish colour. *Stems* three or four inches long, slender, leafy, branched. *Leaves* nearly an inch long, a line broad. *Flowers* small; corolla scarcely longer than the calyx. *Seeds* small, elliptical, rough at the edge with radiant points. Found near Lima by Dombe. 22. *C. scorpioides*. Lam. Ill. Willd. 21. Jacq. Collec. 2. 3. Schmidt Bohem. 1. n. 220. "Stem prostrate; leaves lanceolate, scabrous; peduncles axillary, one-flowered; seeds umbilicated, smooth." *Root* annual. *Stem* somewhat four-cornered, dichotomous; lower leaves opposite. A native of moist shady places in Bohemia. 23. *C. omphalodes*. Linn. Sp. Pl. 7. Mart. 8. Lam. 11. Willd. 22. Bot. Mag. tab. 7. (*Symphytum minus*, borraginis facie. Bauh. pin. 259. *Borrago minor*; Moris. 3. 437. § 11. tab. 26. fig. 3. *Omphalodes pumilaverna*; Tourn. 140.) "Creeping root-leaves ovate-cordate; stem ones ovate, petioled." Willd. "Root perennial. *Stems* slender, leafy, from four to six inches long; some barren, others bearing flowers. *Flowers* blue with a white star in the middle. A native of the south of Europe, where it is said to flower about Christmas. In our gardens it flowers from March to May. 24. *C. cappadocicum*, Willd. 23. (*C. omphalodes* β. Lam. *Omphalodes orientalis corni folio*; Tourn. cor. 7.) "Root-leaves cordate; lowest stem ones lanceolate, petioled; uppermost cordate, sessile." *Root-leaves* on long petioles, acuminate, quite entire, marked with prominent veins underneath, three or four inches long, two or three inches broad; petioles the length of the leaf or more. *Flowers* in a terminal raceme. A native of Cappadocia. 25. *C. myofotoides*, Willd. 24. Billard. ic. pl. fyr. 2. 6. tab. 2. (*C. lithospermifolium*; Lam. 14.) "Root-leaves spatulate-lanceolate; stem ones linear, sessile; seeds membranous, even-surfaced, ciliate-toothed at the edge." *Root* perennial. *Stems* four or five inches high, slender, branched, clothed with short hairs. *Leaves* scabrous and shaggy. *Flowers* in naked terminal racemes, small, alternate. *Nuts* four, smooth, wrinkled, striated, resembling those of *C. omphalodes*, but smaller. The whole plant has the habit

of *myofotis arvensis*. Found on the summit of Mount Lebanon.

CYNOGLOSSUM boraginifolium; Pluk. See *BORAGO africana*.

CYNOGLOSSUM glandulis faucium glabris; Hall. See *MYOLOTIS Lappula*.

CYNOGLOSSUM minus; C. Baul. See *MYOLOTIS Lappula*.

CYNOGLOSSUM perenne maritimum; Moris. See *PULMONARIA marina*.

CYNOGLOSSUM procumbens maritimum; Pluk. See *PULMONARIA maritima*.

CYNOGLOSSUM virginianum flore & fructu minimo; Moris. See *MYOLOTIS Virginiana*.

Preparation and Culture.—*C. lusitanicum* and *C. linifolium*, called Venus' navelwort by our gardeners, are annuals commonly sown to adorn the borders of the flower garden. They succeed best when sown in autumn, and flower earlier, but do not well bear transplanting. *C. omphalodes* should be planted in a moist cool situation; it then readily propagates itself by its trailers, but seldom produces seeds.

CYNOGLOSSUM, in *Gardening*, comprises plants of the herbaceous annual and perennial ornamental kinds. Of which the species cultivated are the flat-leaved hound's-tongue, or Venus's navelwort (*C. linifolium*); the Portugal hound's-tongue, or Venus's navelwort (*C. lusitanicum*); the comfrey-leaved hound's-tongue (*C. omphaloides*).

Method of Culture.—The two first or annual sorts, are usually increased by sowing the seeds in the early spring months, in patches, in the borders, clumps, or other places where the plants are to remain and flower, covering them in a light manner. When the plants appear, they only stand in need of being kept clean from weeds, and having a little water occasionally given them.

But in order to protract the time of flowering, two or three different sowings should be made, at proper intervals, in these sorts of plants.

With regard to the third or perennial sort, it may be easily propagated by taking off the rooted stalks, and planting them out in the situations where they are to remain, either in the spring, summer, or autumnal seasons.

These are a sort of plants which afford much ornament and variety to the garden, as well as the borders, clumps, and other compartments of grounds of the pleasure kind.

CYNOGLOSSUS, in *Ichthyology*, a species of *Pleuronectes*, which see.

CYNOGLUCOS, from *κυνος*, dog, and *λύκος*, wolf, in *Natural History*, a name given by the ancient writers to a creature which had the shape partly of a dog, and partly of a wolf, and was generated, according to their accounts, by a mixture of those two species of animals in copulation, as the *Leucocotta* was, between the hyena and lionsess.

CYNOMETRA, in *Botany* (*κυνος*: *αίτη*, canis matrix, a foolish allusion to a fancied resemblance in the form of the fruit), Linn. Gen. 519. Schreb. 710. Willd. 320. Gært. 898. Juss. 350. Vent. 3379. Class and order, *decandria monogynia*. Nat. Ord. *Leguminosae*, Linn. *Leguminosae*; Juss.

Gen. Ch. *Cal.* Perianth four-leaved; leaflets oblong, reflexed. *Cor.* Petals five, lanceolate, equal, nearly erect. *Stam.* Filaments ten, longer than the petals; anthers oval, bifid at the tip. *Pist.* Germ superior, boatshaped; style filiform, the length of the stamens; stigma simple. *Peric.* Legume somewhat fleshy, short, lunate, or nearly hemispherical, slightly compressed laterally, containing one or two large, elliptical, slightly compressed seeds.

Eff. Ch. Calyx four-leaved. Anthers bifid at the tip. Legume somewhat fleshy, shaped like a half-moon, with one or two seeds.

Sp. *C. caudiflora*, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ill. Pl. 331. fig. 2. Willd. 1. Gært. tab. 156. (Cynomorium; Rumph. amb. 1. 163. tab. 62. Burm. Ind. 100.) "Trunk floriferous." Roots knotty and large, appearing above ground, interspersed with curled smaller ones. Trunk seldom two feet high, very irregular, knotty, covered with a thick, rugged, dark-coloured bark; the head not large, but dense, consisting of thick long branches, subdivided into many others. Leaves only near the end of the smaller branches, in alternate conjugate pairs, each pair on a short common petiole, three or four inches long, an inch and half broad, entire, smooth, firm, flexible, sharp-pointed; with a straight rib prominent on both surfaces, and dividing the leaf into two very unequal parts. Flowers proceeding from the trunk, the large branches, and those roots which are above ground, Rumph. Legume large, the size of half the palm of the hand, or more, compressed like a lens, with a groove, like a future, along its whole circuit, tubercled on the sides and rough to the touch like a woollen cloth, one-celled, not dehiscent. Seed nearly filling the cavity of the legume, attached to it by a short thick chord at the middle of the future, smooth, marked with curved capillary vessels proceeding from the umbilicus, of a red ferruginous colour; with a simple, coriaceous, thin integument, which, in old seeds, is scarcely separable from the kernel in boiling water; albumen none, nor any vestige of it; embryo the shape of the seed, white; cotyledons plano-convex, hollowed within into a small chamber to contain the radicle; plume slender, two-horned, surrounded about its base by short, soft, matted hairs, by which it is separated from the cotyledons to the distance of half a line; radicle conical, immersed, centrifugal. A native of the East Indies. Obs. Lamarck is in possession of specimens of fruit and leaves, received from Sonnerat, which do not appear to differ from this species, except that the legumes have two seeds. 2. *C. ramiflora*, Linn. Sp. 2. Mart. 2. Lam. 2. Ill. Pl. 331. fig. 1. Willd. 2. (Cynomorium sylvestre; Rumph. amb. 1. 164. tab. 63. Iripa; Rheed. Mal. 4. 65. tab. 31. Burm. Ind. 100. Rai. Hist. 1675.) "Branches floriferous." A lofty evergreen tree, about sixty feet high. Trunk thick, solid, cinereous, reddish within; branches numerous, not forming so dense a head as in the preceding species. Leaves conjugate, nearly sessile, roundish, emarginate, smooth, dark green and shining above, paler underneath, unequally divided by the midrib, nerved. Flowers small, white, scentless. Legumes oblong-roundish, compressed, tubercled, furrowed, dehiscent on both sides. Seed solitary. A native of the coast of Malabar, and other parts of the East Indies.

CYNOMOLGUS, in *Zoology*, a species of *Simia*, which see.

CYNOMORIUM, in *Botany* (*κυνος μοριον*, another indelicate foolish comparison), Linn. Gen. 1033. Schreb. 1594. Willd. 1620. Juss. 445. Class and order, *monœcia monandria*. Nat. Ord. *Amentaceæ*; Linn. *Undetermined*; Juss.

Gen. Ch. Barren and fertile flowers in the same, erect, club-shaped, imbricated catkin. Barren ones. Cal. Perianth four scales of the catkin. Cor. none. Stam. Filament single; anther two-celled. Fertile ones. Cal. Perianth four-leaved (superior; Linn.) or none. Cor. none. Pijl. Germ ovate; style single; stigma obtuse. Peric. none. Seed single, roundish.

Eff. Ch. Barren flowers. Perianth four-leaved. Corolla none. Fertile flowers. Perianth four-leaved, or none. Corolla none. Seed one, naked.

Sp. 1. *C. coccineum*. Linn. Sp. Pl. Mart. 1. Lam. Enc. Ill. Pl. 742. Willd. 1. (Fungus typhoides, Bocc. Mus. 2. 69. Sic. 80. tab. 81. Till. Pis. 64. tab. 25. *F. mauritanicus ruber*; Pet. Gaz. tab. 39. fig. 8. *Cynomorium purpureum*; Mich. Gen. 17. tab. 12.) "Stem scaly; catkin cylindrical; scales imbricated, ovate, retuse." A parasitical, leafless plant, appearing somewhat like a fungus. Stem about a foot high, as thick as the human finger, erect, solid, becoming woody when dry; entirely covered, when young, with imbricated, oval, acute, white scales, most of which fall off when the flowers begin to appear. The whole plant is then of a purple or scarlet colour. Flowers in a catkin about the length of the stem, and twice its thickness, terminal, consisting of barren and fertile imperfect flowers closely intermixed, sometimes accompanied by a few perfect ones; three of the calyx-scales of the barren flower club-shaped; the other inferior, larger, very obtuse, channelled; filament firm, straight, longer than the scales; calyx-scales of the fertile flower club-shaped, tubercled, equal, permanent. A native of the south of Europe, and of the coast of Barbary, on the roots of trees and shrubs near the sea. 2. *C. jamaicensis*. Mart. 2. Willd. 2. Swartz Prod. 12. Fl. Ind. Occ. 1. 11. "Stem scaly; catkin elongated; scales imbricated, halved, rhomboidal." Stem three, four, or five inches high, commonly smallest towards the bottom, succulent, fleshy, at first thickly covered with cordate scales, which gradually fall off, and leave it thickly beset with transparent denticles, intermixed with a few tubular trifid flowers. A native of Jamaica in shady inland woods. 3. *C. cayanensis*. Mart. 3. Willd. 4. Swartz Prod. 12. Fl. Ind. Occ. 1. 13. "Stem naked; catkin somewhat globular; scales roundish, peltate." A native of Cayenne. 4. *C. balanophora*. Willd. 3. (*Balanophora fungosa*; Forst. Prod. n. 333. Lam. Enc. and Ill. Pl. 742.) "Stem scaly; catkin oblong; scales spreading, oblong-lanceolate." Willd. Barren flowers in two or three rows on the lower part of the catkin, larger, distinct; calyx-scales (petals; Forst.), lanceolate, rather thick, spreading; stamen the length of the scales, erect, cylindrical; anther large, oval-oblong, erect, channelled. Fertile flowers above them, much more numerous, extremely small, disposed several together on very minute, distinct, but close-set receptacles, without a calyx or a corolla. A native of the island of Tanna, in the South Sea. All the species are parasitical and perennial.

Obs. We have followed Willdenow in adding the *Balanophora* of Forster to this genus, an union suggested by Jussieu, and which La Marck seemed inclined to approve, though he did not adopt. We have accordingly ventured to make some alteration in the generic character; but the fructification of all the species stands in need of a more accurate investigation.

CYNOMORIUM; Rumph. See CYNOMETRA.

CYNONTODIUM, Hedw. See TRICHOSTOMUM.

CYNOPHALLOPHORUS. Plum. See CAPPARIS *Cynophallophora*, n. 37.

CYNOPHONTIS, in *Antiquity*, a festival observed in the dog-days at Argos, and so called *απο της κυνης φωνης*, i. e. from killing dogs; because it was usual on this day to kill all the dogs they met with.

CYNOPOLIS, or CYNOSPOLIS, "city of dogs," in *Ancient Geography*, a town of Upper Egypt, supposed, by some ruins of columns and ancient edifices, to be the present *Mi-*

net. The inhabitants of this city held the dogs in great veneration. The priests nourished this animal with sacred meat, in honour of Anubis, the companion and guardian of Osiris.—Also, a town of Asia in Haïria.

CYNOPOLITES *Nomon*, a name of Egypt, extending on both sides of the Nile; the capital of which, according to Strabo, was *Cynopolis*.

CYNOREXY, or **CYNODES OREXIS**, an immoderate appetite to the degree of a disease; called also *fames canina*, and *bulimy*.

CYNORRHODON, in *Botany*, the *dog-rose*, as the Greek term signifies; the common wild briar, or wild white rose, so common in our hedges.

CYNORTION, in *Ancient Geography*, a mountain of Greece in the Peloponnesus, where was a temple of Apollo, according to Pausanias.

CYNORYNCHIUM, in *Botany*, Pluk. See **CHELONE pubescens**.

CYNOSARGES, a place of Greece in Attica, near Athens; where were the gymnasium and a temple consecrated to Apollo. The Cynic philosophers had their school here.

CYNOSBATOS, from *κυνων* and *βατος*, *bush*, in *Botany*, a word used as the name of different shrubs by different authors. It is now generally used as the name of the wild, or dog-rose; but some authors have applied it to the common bramble; others to the *oxycanthus*, and others to the *caper-bush*.

The fruit of the wild rose is the *hip*, used in conserve, and said to be good in disorders of the breast, &c. See **CONSERVE**.

CYNOSORCHIS, in *Botany*, C. Bauh. See **ORCHIS pyramidalis**, *usulata* & *militaris*.

CYNOSSEMA, in *Ancient Geography*, a promontory of the Thracian Chersonesus.—Also, a promontory of the Doride, placed by Strabo between the towns of Lorimus and Cnidus.—Also, a maritime place of Egypt, in the vicinity of Taposiris. Strabo.—Also, a place of Africa in Libya. Steph. Byz.—Also, a place of Greece, in Calydonia. Id.—Also, a place of Thrace, in the environs of Maronea. Strabo.

CYNOSURA, in *Astronomy*, a denomination given by the Greeks to *Ursa minor*, or the little bear.

The word is formed of *κυνος*, *q. d.* the *dog's tail*.

This is the constellation next our pole, consisting of seven stars; four whereof are disposed like the four wheels of a chariot; and three lengthwise, representing the beam: whence some give it the name of the *chariot*, or Charles's *wain*: a name now more commonly given to the seven principal stars forming the same kind of figure in the Great Bear.

From these seven stars it is the pole takes its name, *Septentrionalis*; and the rest of the hemisphere, as far as the line, *Septentriones*.

CYNOSURA, in *Ancient Geography*, a promontory of Greece, in Attica, formed by a small chain of mountains, being the continuation of mount Hymettus towards the east.—Also, a place of the Peloponnesus, in Arcadia.—Also, a place of the Peloponnesus in Laconia.

CYNOSUROS, in *Zoology*, a species of **SIMIA**; which see.

CYNOSURUS, in *Botany, (*κυνος ουρα*) dog's-tail grass. Linn. Gen. 87. Schreb. 118. Willd. 138. Gært. 8. Juss. 31. Vent. 2. 105. Class and order, *triandria digynia*. Nat. Ord. *Gramina*, Linn. *Gramineæ*, Juss.*

Gen. Ch. Receptacle common unilateral, with or without bractes. *Cal.* Glume two-valved, two or many-

flowered. *Cor.* two-valved; the outer concave, longer; the inner flat, awnless; nectary two-leaved; leaflets ovate, acute, gibbous at the base. *Stam.* Filaments three, capillary; anthers oblong. *Pist.* Germ top-shaped; styles two, villous, reflexed; stigmas simple. *Peric.* only the permanent corolla closely investing the seed. *Seed* single, oblong, acuminate at each end.

Eff. Ch. Calyx two-valved, chaffy, bearded, two or many-flowered, on a unilateral receptacle.

Obs. It has often been observed that this genus, as it was established by Linnæus, consists of species differing from each other in general habit, and other characters. Gærtner has divided it into two, *cynosurus* and *cleusine*, with the following characters. 1. *Cynosurus*. *Involucres* pectinated or pinnated, under the flowers. *Calyx* two-valved, two or four-flowered. *Cor.* two-glumed, longer than the calyx. *Seed* free, covered, furrowed on one side. 2. *Eleusine*. *Cal.* two-valved, four-flowered. *Cor.* two-glumed, with unequal valves. *Capsule* membranous, one-celled, valveless, one-seeded. *Seed* globular. It is by this pericarp, which he calls a capsule, but which seems more properly an aril, that this genus, according to him, is distinguished from all the other known grasses. La Marck, when he wrote the alphabetical part of the French Encyclopedie Methodique, adhered to the Linnæan arrangement; but afterwards in his "Illustration des Genres," adopted that of Gærtner, retaining under *cynosurus* only cristatus, echinatus, and aurcus, which Dr. Stokes, in Withering's arrangements, had some time before pronounced to be the only legitimate species. After considerable deliberation, we have judged it most expedient, at least for the present, to keep the original genus entire.

* *With Bractes.*

Sp. 1. *C. cristatus*. Linn. 1. Mart. 1. Lam. 1. Willd. 1. Schreb. Gram. 69. tab. 8. fig. 1. Flor. Dan. tab. 238. Lam. Ill. tab. 47. fig. 1. Eng. Bot. 316. (Phleum cristatum; Scop. Carn. 2. n. 81. Gramen pratense cristatum; Bauh. Pin. 3.) "Bractes pinnatifid." Linn. "Bractes pinnate-distichous, awnless; spike simple, linear." Smith. *Root* perennial, fibrous, tufted. *Stems* several, a foot high, erect, stiff, leafy, naked near the top, cylindrical, striated, quite smooth. *Leaves* linear, acute, even-surfaced; sheaths cylindrical, striated, quite smooth; stipula short, obtuse, jagged. *Spike* obtuse, stiff and straight; rachis somewhat zig-zag, angular, smooth and even. *Spikelets* alternate, ovate, many-flowered, nearly sessile; calyx-glumes linear, acute, keeled; keel scabrous; florets alternate, a little tumid, scarcely keeled, scabrous towards the summit, mucronate; bractes composed of abortive flowers, which are alternate, compressed-keeled, scabrous on the back, acute, scarcely awned. Ray mentions a variety with four rows of spikelets. Smith. Common in dry pastures in England, and other parts of England. 2. *C. echinatus*. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Willd. 3. Gært. tab. 1. Lam. Ill. Pl. 47. fig. 2. Eng. Bot. 1333. (Gramen alopecurioides spica aspera; Bauh. Pin. 4. Schench. Gram. 80. tab. 2. fig. 3. D. Barr. Rar. tab. 123.) "Bractes pinnated, spike compound, ovate. *Root* annual, fibrous, downy. *Stems* one or more, ascending, leafy, cylindrical, striated, smooth. About seven inches high. *Leaves* lanceolate, ovate at their base, acute, flat, striated, roughish on both sides; sheaths a little inflated, somewhat compressed or two-edged, furrowed, roughish; stipula lanceolate. *Spike* dense. Spikelets alternate, ovate; bractes consisting of alternate, lanceolate, membranous, ribbed, rough husks, each tipped with a straight, rough, purple

CYNOSURUS.

awn, various in length; calyx-glumes equal, thin, beardless; florets two or more; outer glume roughish, inner finely fringed. Smith. A native of a sandy soil on the southern coast of England, and other warmer parts of Europe. 3. *C. aureus*. Linn. Sp. Pl. 10. Mart. 13. Lam. 6. Willd. 2. (Gramen paniculâ pendulâ aurâ; Bauh. Pin. 3. G. barcinonense; Tournef. 523. G. sciurum, Barr. ic. 4.) "Panicle racemed; bractes resembling spikelets, pedicelled, fasciated, pendulous, awnless; spikelets about three-flowered, awned. Root annual. Stems from four to seven inches high, leafy. Leaves about two lines broad, smooth. Panicle two or three inches long, narrow, silky; bractes pinnate, chaffy, yellowish-green; pinnæ obtuse, concave, alternate. A native of the south of Europe, among rocks. 4. *C. falcatus*. Willd. 2. Thunb. Prod. 23. (Melica falk; Linn. jun. Supp. 109. Mart. Lam. Enc. & Ill.) "Bractes simple, lanceolate." Culm a foot and half high, even-surfaced. Spike the length of a finger, compressed, imbricated; bractes acuminate, three-nerved, a little longer than the spikelets, one to each spikelet; spikelets with a white edge, pubescent; calyx two-flowered, one larger, one smaller, with the rudiment of another; outer glume of the larger floret inversely egg-shaped, ciliated with white hairs, very obtuse, emarginate; inner one long, narrow, smooth, lanceolate; styles two, pubescent; smaller flower similar to the other, but without styles. Found by Sparman at the Cape of Good Hope. The younger Linnæus found no stamens in the specimens which he examined, but seems to have conjectured that the florets are imperfect, and that the smaller one is stamiferous.

** Without Bractes.

5. *C. monostachyos*. Mart. 17. Willd. 13. Vahl. Symb. 2. 20. "Spike simple; calyxes awl-shaped, about three-flowered; florets awned." Culm a foot and half high, upright, smooth. Leaves awl-shaped, narrow. Spike a span long; rachis convex and keeled on the outside; spikelets imbricated on the inner side, alternate, smooth; outer calyx-valve the length of the florets; inner one smaller; florets bearded at the base, compressed, one perfect, another imperfect and stamiferous, the third quite abortive; outer valve of all the three awned below the tip; awns straight, twice the length of the calyx. A native of the East Indies. 6. *C. filiformis*. Mart. 16. Willd. 12. Vahl. Symb. 2. 20. "Spike solitary, two-rowed; calyxes awl-shaped, three flowered; abortive floret awnless." Culms creeping, branched, filiform, compressed at the bottom; internodes an inch long. Leaves at the joints, several on each side, an inch and half long, bristle-shaped; sheaths compressed, equitant, nearly the same length with the leaves, and broader. Floriferous culms terminal, about seven inches long, quite simple, jointed, with a single awl-shaped leaf towards the middle. Spike an inch long, linear; spikelets small, alternate, compressed, smooth; calyx valves spreading, nearly equal, the length of the florets, acute; florets usually three, one perfect, sessile; another imperfect, stamiferous; the third quite abortive; the two former with an awn below the tip, a little longer than the calyx. A native of the East Indies. 7. *C. uniolæ*. Linn. jun. Supp. 110. Lam. Enc. 5. Mart. 7. Willd. 11. Thunb. Prod. 17. "Spike solitary, two-rowed; calyxes many-flowered, mucronate; corollas shaggy at the base." Quite smooth, with the habit of uniola, but its calyx is bivalved, not many-valved. Spike linear; spikelets sessile, pressed close to the rachis, alternate, spreading at the sides, oblique, quite smooth. A native of the Cape of Good Hope. 8. *C. paniculatus*. Willd. 5. Thunb. Prod. 23. "Spike compound,

ovate; calyx many-flowered; one glume mucronate; corollas hairy at the base." A native of the Cape of Good Hope. 9. *C. Lima*. Linn. Sp. Pl. 3. Mart. 3. Lam. Encyc. 3. Willd. 6. Læfl. it. 41. Cavan. ic. 1. 62. tab. 91. (Eleusine lima; Lam. Ill. 1128.) "Spike solitary; inner glume of the calyx placed below the spikelets;" Linn. "Spike rigid; spikelets sessile, in two rows, but strictly unilateral, about five flowered; glumes acute;" Lam. Root annual. Culms slender, from five to seven inches high. Leaves very narrow, shorter than the sheath, slightly rolled in at the edges so as to give them a rush-like appearance. Spike scarcely an inch long, oval, sometimes conical, glaucous; spikelets compressed, awnless, lower ones somewhat peduncled; calyx-glumes awl-shaped; outer one larger, keeled, roughish at the edges; inner one flat. A native of Spain. 10. *C. durus*. Linn. Sp. Pl. 4. Mart. 4. Lam. Enc. 4. Willd. 7. Pollich Pal. n. 100. tab. 1. fig. 1. (Eleusine dura; Lam. Ill. 1127. Gramen loliaecium majus lupinum; Bauh. Prod. 19. G. arvense poly-podii panicula; Barr. Icon. 50. Lolium; Hall. n. 1419. Poa. Scop. n. 101.) "Spikelets alternate, sessile, rigid, obtuse, adpressed;" Linn. Root annual. Culms few, about three inches high, almost procumbent, leafy. Leaves smooth and even, scarcely longer than the sheath, a line and half broad. Spike erect, branched, compressed, oval spiculate, awnless; rachis of the branches zig-zag; spikelets sessile, alternate, two-rowed, three-flowered, linear, striated, smooth. A native of the south of Europe. Linnæus thought its true genus doubtful; according to La Marek, it is more nearly allied to lolium than to poa. 11. *C. retroflexus*. Mart. 13. Willd. 8. Vahl. Symb. 2. 20. "Spike compound, spikelets aggregate; calyx two-flowered, armed; florets awnless." Stems cylindrical, smooth. Leaves about seven inches long, awl-shaped, smooth. Common rachis grooved, angular; spikelets in threes at each tooth of the rachis, an inch long, linear, spreading; lateral ones sessile; middle one on a short pedicel, all bent back when old; there is sometimes a fourth sessile spikelet a little above the others: partial rachis zig-zag; florets compressed, smooth. A native of the East Indies. 12. *C. coracanus*. Linn. Sp. Pl. 9. Mart. 8. Lam. Enc. 7. Willd. 14. (Eleusine; Gært. tab. 1. 11. Lam. Ill. Pl. 48. fig. 1. Gramen dactylon orientale; Pluk. Alm. 274. tab. 95. fig. 1. Panicum gramineum, five Naatsjoni; Rumph. Amb. 5. 203. tab. 76. fig. 2. Tsjitti-pullu; Rheed. Mal. 12. 149. tab. 78.) "Spikes digitate, incurved; culm compressed, erect; leaves nearly opposite." Root annual. Culms four or five feet high, leafy, compressed, sometimes a little branched. Leaves long, three lines broad, with a few long distant hairs just above the sheath. Spikes from four to six, an inch and half long, about five lines broad, thick, somewhat compressed, at first erect; spikelets numerous, short, sessile, four-flowered, closely imbricated in several ranks on the same side of the rachis. A native of the East Indies. The seeds are eaten in a scarcity of rice. 13. *C. floccifolius*. Mart. 20. Willd. 15. Vahl. Symb. 1. 10. Forst. Ægypt. 21. n. 73. "Spikes linear, straight; leaves folded together, alternately bearded at the edges." In habit resembling the preceding species. Spikes alternate, upper ones in pairs. Leaves alternate, smooth on the surface; sheaths not ciliated. A native of Ægypt. 14. *C. tristachyos*. Lam. Encyc. 10. (Eleusine; Illust. 11. 23.) "Spikes ternate, thick, obtuse, erect; spikelets sessile, adpressed, about four-flowered." Culms three inches high, compressed, leafy. Leaves alternate, in two opposite rows, often longer than the culms, a line and half broad. Spikes six or seven lines long, four or five broad, sessile; spikelets clove. Found by Commerçon near Monte Video. 15. *C. penicillatus*. Mart. 18. Willd.

Willd. 16. Vahl. Symb. 2. 21. "Spikes digitate; calyx four-flowered, awned at the back; outer petals of the perfect flowers awned, with bearded pencils." *Culm* cylindrical, finely streaked, pubescent at the top. *Spikes* in threes, sometimes solitary, on very short pedicels, four or five inches long, bearded at the base, sometimes a little recurved at the end; rachis somewhat convex on the outside, channelled within; spikelets from the inner side only, sessile, alternate, much crowded, awl-shaped, slightly compressed, spreading; inner valve of the calyx lower, ovate acuminate, almost transparent; outer one three times longer, lanceolate, attenuated, compressed, keeled, grooved at the back, ciliated in a raised line on each side of the groove; awn on the middle of the valve, upright, the length of the valve; florets bearded at the base, two of them perfect, outer petal bearded at the top with two pencils, ciliated with long, very soft, white hairs; two smaller, probably only stamiferous; one of them awnless. A native of the East Indies. 16. *C. pappaloides*. Mart. 19. Willd. 17. Vahl. Symb. 2. 21. tab. 27. (*Chloris petraea*; Thunb. but not of Swartz.) "Spikes digitate; calyx two-flowered, somewhat globular; exterior valve awned; florets awnless." *Culm* a foot high, almost leafless. *Root-leaves* two inches long, sheathing, linear-lanceolate, sharpish; sheaths compressed, equitant, twice the breadth of the leaves. *Spikes* five, an inch and half long, sessile, woolly at the base, linear, narrow, ferruginous, shining; spikelets the size of millet seed, alternate, crowded, very obtuse; outer valve of the calyx shorter than the corolla, ovate, awned a little below the tip, emarginate, keeled; inner ones smaller; outer glumes of the corolla keeled, ciliated at the edges and on the keel. A native of the Cape of Good Hope. 17. *C. ægyptius*. Linn. Sp. Pl. 7. Mart. 9. Lam. Enc. 8. Willd. 18. (Eleu. sine cruciata; Lam. Ill. 1125. Pl. 48. fig. 2. Gramen dactylon ægyptiacum; Bauh. Pin. 7. Theat. 110. Tourn. 521. Morf. Hist. 3. 184. § 8. tab. 3. fig. 7. Schench. Gram. 109. *G. ischænum*; Pluk. Aim. 175. tab. 300. fig. 8. Neiem el Sahb. Alp. Ægyp. 56. tab. 43. Gramen; Rumph. Amb. 6. tab. 4. fig. 1. Cavara-pulla; Rheed. Mal. 12. tab. 69.) "Spikes digitate, in fours, obtuse, widely spreading, mucronate; calyx mucronate; stem creeping." *Root* annual. *Culm* from six to nine inches long, ascending, bent at the joints, leafy. *Leaves* two or three lines broad, rough at the edges. *Spikes* generally four, sometimes five, scarcely an inch long, thick, compressed, obtuse, with a small point; spikelets short, close, mucronate, two-flowered. A native of Asia, Africa, and America. Obs. La Marek considers this species as an eleusine, in opposition to Gærtner, who asserts that, notwithstanding the similarity of its habit, it must be referred to another genus. May it not be justly doubted whether the pericarp on which Gærtner lay so much stress, be in this case a sufficient generic distinction? 18. *C. indicus*. Linn. Sp. Pl. 8. Mart. 10. Lam. Encyc. 10. Willd. 19. (Eleusine; Gært. Lam. Ill. Pl. 48. fig. 3. Panicum compressum; Forsk. Decl. 18. Gramen dactyloides; Burm. Zeyl. 106. tab. 47. fig. 1. *G. vaccinum*; Rumph. Amb. 6. 10. tab. 4. fig. 2. Ranara-pullu; Rheed. Mal. 12. 131. tab. 16.) "Spikes digitate, linear; culm compressed, declined, with a knot at the base." *Root* annual. *Culm* sometimes only four or five inches, sometimes more than a foot long, leafy, commonly with a branch springing from the knot. *Leaves* about two lines broad, in two rows, beset with loose hairs, especially about the sheath. *Spikes* from three to seven, in an open fascicle two or three inches long, generally with a solitary spike below the fascicle; spikelets three or four-flowered, short, close, awnless, in two or three longitudinal rows. A native of the East Indies.

19. *C. pectinatus*. (Lam. Encyc. 12. C. Eleusine; Ill. 1126.) "Spikes linear, somewhat pectinate, alternate, in a kind of raceme; spikelets three-flowered, shorter than the mucronate calyx." *Leaves* three lines broad or more, smooth. *Spikes* from forty to fifty, in an erect raceme five or six inches long, sessile, alternate, solitary or in pairs; smooth, compressed, diminishing in length from the bottom to the top, lower ones from twelve to fifteen lines long; spikelets sessile, in two rows, alternate, compressed, smooth, with one of their edges to the rachis as in lolium, two or three-flowered. Found in the East Indies by Sonnerat. 20. *C. virgatus*. Linn. Sp. Pl. 6. Mart. 11. Lam. Enc. 13. Willd. 20. (*Festuca virgata*; Lam. Ill. Gramen loliaceum paniculae specis simplicibus; Brown. Jam. 137. *G. dactylon*; Sloan. Jam. 34. Hist. 1. 113. tab. 70. fig. 2.) "Panicle with simple branches; spikelets sessile, about six-flowered; uppermost floret barren; the lower ones somewhat awned." β *Domingensis*. "All the florets armed." Mart. 12. Jacq. Mif. 2. 363. Ic. Rar. 1. tab. 22. (*Bromus capillaris*; Mœneh. Meth. 194.) "Culms about a foot and half high, erect, leafy. *Leaves* from two to four lines broad, with loose hairs on their upper surface towards the base, and a little upon the sheath. *Panicle* from five to seven inches long, pale green, sometimes purplish. *Spikes* from twenty to thirty, two or three inches long, linear, slender, some alternate, others fascicled or whorled, two or three together at intervals; spikelets sessile, alternate, almost two-rowed, but truly unilateral, very small, smooth; calyx-glumes lanceolate, keeled, compressed, rough at the back. A native of the East and West Indies.

CYNOSURUS eruciformis; Ait. Mart. Willd. See PHALARIS *eruciformis*.

CYNOSURUS caruleus; Linn. & *C. sphærocephalus* Jacq. &c. See SESLERIA.

CYNOSURUS scoparius; Lam. Enc. See ANDROPOGON *polydactylon*.

CYNOXYLON, *Americanum folia crassifusculo*; Pluk. See NYSSA *aquatica*.

CYNOZOLOS, a name given by some of the old Greek writers, and, from them, copied by Pliny, and the Latins, to express the black *chamæleon thistle*, a poisonous plant, which it was very necessary to distinguish perfectly from the plant called the white *chamæleon thistle*, which was a safe and esculent plant.

CYNTHIUS, or *CYNTHUS*, in *Ancient Geography*, a mountain near the sea, towards the middle of the eastern coast of the island of Delos. The city of Delos was at the foot of this mountain, between which and the sea, over-against the isle of Rhénia, was a theatre of marble. This mountain was said to be so high, that the shadow of it covered the whole island; but modern travellers represent it as a hill of very moderate height. Here Latona is said to have been delivered of Apollo and Diana; whence it derived its peculiar sanctity. It is one block of ordinary granite; cut on the side that faces the city in regular steps, enclosed with a wall. On the top of the mountain are the remains of a stately building, with a Mosaic pavement, broken pillars, and other monuments of antiquity. This mountain, as well as the whole island, was consecrated to Apollo; and hence he, and also Diana, derived the appellation of Cynthian.

CYNURA, a town of Greece, in the Peloponnesus, the territory of which was always a subject of dispute between the kings of Lacedæmon and those of Argos.

CYNURIA, a town of the Argolide, in that part which belonged to Laconia. The inhabitants of this town were called *Cynurii*.

CYNUS, a place of Greece on the sea-coast, N.E. of Opuntia, of which it was the port.

CYLOCK, in *Zoology*, a name given to the Orang-Utang, or *Simia Satyrus*; which see.

CYON, or CION, a graft, spring, or sucker.

CYON, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

CYPÆRA, a town of Greece, in Thessaly.

CYPÆTA, a town of Africa, in Libya.

CYPARISSA, a town of various orthography, situated in that part of Messenia which, extending itself towards the north-west, formed with the territory of Elis a gulf, called the "gulf of Cyparissa." In the time of Pausanias, it had two temples, one of Apollo and another of Diana *Cyparissia*. It has been conjectured, that this town took its name from the great quantity of cypress which grew near it. The *Cyparissa* of Homer is thought by some persons, in deference to Strabo, to have been the burgh of Lycorea, situated on a mountain near Parnassus. According to Pausanias, it was the same town with Anticyra, situated on an isthmus, which united with the continent a small peninsula, that extended to the gulf of Corinth. Anticyra was celebrated among the ancients for the hellebore which was supplied by its vicinity. This place is now called *Asprospitia*.

CYPARISSIS, a river of the Peloponnesus in Messenia, near the town of Cyparissa. Both the river and town are called *Arcadia*.

CYPARISSIA, a town on the isthmus of a peninsula in Laconia, N.W. of Hypercentatum, which had a port in the lower part of a small bay. It was destroyed in the time of Pausanias. Near its ruins was a temple of Minerva *Cyparissian*.—Also, one of the names given to the isle of Samos.

CYPARISSIUM PROMONTORIUM, a promontory of the Peloponnesus in Messenia; which took its name from that of the town Cyparissia. Strabo.

CYPARISSIUS, a small river of Messenia, south of Aulon, west of Eleetra; which received the *Cocus*. The river discharged itself into a small gulf, called the gulf of Cyparissus, or Cyparissa. The gulf is now called the gulf of *Ronchio*.

CYPARISSUS, an ancient town of Greece, in the Phocide, placed by Steph. Byz. and Eustathius near mount Parnassus and the town of Delphi.

CYPASIS, a town situated towards the Hellespont.

CYPERELLA, in *Botany*, Mich. See SCHÆNUS.

CYPERI *Genus Indianum*; Pluk. See *SCIRPUS retrofractus*.

CYPEROIDES, the third natural order of monocotyledonous, hypogynous plants in the system of Jussieu, with the following character. *Flowers* perfect, or monoicous, very rarely dioicous, each furnished with a chaffy glume, which sustains the office of a calyx; glumes one-flowered, crowded, variously disposed so as to form either spikes or fascicles; sometimes empty, probably owing to the flowers having become abortive. *Stamens* generally three, inserted under the pistil. *Germ* one, superior; style one; stigmas most frequently three, sometimes two. *Seed* one, naked, or ariled, *i. e.* covered with a tunic; in some furrowed by bristles or soft hairs springing from the base. *Coraculum* and germination as in the graminæ. *Stems* or culms cylindrical, or triquetrous; in most without knots, in a few jointed. *Floral leaves* sessile; root and stem one sheathing; sheath entire. It contains the following genera. I. Flowers monoicous. Carex. II. Flowers perfect. Fuirena, schænus, galinia, eriophorum, scirpus, cyperus, thryocephalum, kil-

lingie, mapania, elryfitrix. Ventenat has admitted only carex, schænus, eriophorum, scirpus, and cyperus.

CYPEROIDES; Tourn. Mich. Schænel. See CAREX.

CYPERUS, (κυπερος; Hippoc. Theophras. Dioscor.) Linn. Gen. 66. Schieb. 93. Willd. 112. Gært. 13. Juss. 27. Vent. 2. 92. Clats and order, *triandria monogynia*. Nat. Ord. *Calamaria*, Linn. *Cyperoides*, Juss.

Gen. Ch. *Cal.* a single scale to each flower, keeled, convex, permanent, composing part of an imbricated two-rowed spike, with the rows opposite to each other. *Cor.* none. *Stam.* Filaments generally three, sometimes two or one; anthers oblong, furrowed. *Pist.* Germen superior, very small; style filiform, long; stigmas three, capillary. *Styl.* single, naked, generally somewhat triangular, acuminate, without any hairs at the base.

Ess. Ch. Flowers imbricated in two rows, perfect. Corolla none. Seed single, naked, beardless.

This vast genus is divided into two principal sections, the first consisting of species with a round stem, the others having a triangular one. The latter, by far the most numerous, are subdivided according as their spikelets are one or more, and sessile, or very numerous in branched or compound umbel-like panicles. Willdenow reckons 76 species of *Cyperus* in all, but this is perhaps scarcely half the true number.

In the first section we find *C. minimus*, Linn. of which *C. tenellus* L. Suppl. 103. (*Scirpus setaceus* α Rottb. tab. 15. f. 4.) is a variety, and the very remarkable *C. articulatus*, Linn. *Sp. Pl.* whose naked and jointed stems are two or three feet high. It grows in Jamaica, as well as in Egypt and the East Indies. See its figure in Sloane's Jamaica, t. 81. f. 1.

In the second section are *C. longus*, Linn. *Sp. Pl.* 67. Engl. Bot. t. 1309. whose long creeping roots are highly aromatic and agreeable.—*C. rotundus*, an oriental species, whose round tuberous knobs have a similar fragrance, and are used in Greece, where they are still called *κύπερον*, to keep insects away from clothes.—*C. esculentus*, whose radical tubers taste like very sweet filberds, and are sold in the markets of Italy and the Levant. The plant has been cultivated in our green-houses, where its roots increase, but never bear flowers. This is Dulcichinum of Dodonæus, p. 340; *C. esculentus* of Gerarde em. 32. The Italians call it *Trafis*.—Above all the *C. Papyrus* is most remarkable, the celebrated Papyrus of the ancients, so called perhaps from the Syrian name *Babcer*, whence also our word *paper*. This grows in Egypt, Syria, Sicily, and Madagascar, in watery places. It has flowered finely in England, having been but lately brought hither from the south of Europe. The stem is many feet in height, and terminated by a very large and compound umbel, or rather cyme, of innumerable flowers. The root is very large and creeping. Leaves sword-shaped, sheathing the lower part of the stem. The ancient paper, it must be confessed of a very rude kind, was made of the inner rind of the stem cut into strips, and laid together in parallel and transverse rows, which being pressed with weights adhered together. An ancient manuscript, composed of such paper, may be seen in the British Museum. The floral *thyrsus* or tuft of the *Papyrus* was used to adorn the temples and statues of the gods. Two new species of *Cyperus*, found by Dr. Sibthorp, are figured in the *Flora Græca*, and described by Dr. Smith; *viz.* *C. comosus*, t. 44. "Stem triangular, naked. Umbel leafy. Spikelets linear, very long. Knobs of the root ovate, obscurely zoned."—This grows in marshes near Patras, and has a fragrant root, a large and handsome umbel, with remarkably long linear spikelets of a deep shining brown. *C. radicosus*, t. 45. "Stem

“Stem triangular, naked. Umbel leafy. Spikelets lan-
ceolate. Leaves widely spreading, rigid, recurved.”—
Found on the sandy banks of the Ryndacus, between Smyrna
and Brusa, as well as in some of the Greek islands. The
roots are very long, perpendicular, creeping, beset with
frequent knobs. Stems a span high. Umbel small, twice
compound, with reddish-brown spikelets. Leaves remark-
ably spreading, rigid, recurved at their points.

CYPERUS *Root*, in the *Materia Medica*, the name of a
root used in medicine, of which there are two kinds, the
long and the round; the long cyperus is of our own growth;
the round, when genuine, we have from the East Indies;
but what is usually sold is the root of a bastard kind, com-
mon about our own ditches, and called by authors, by
way of distinction from the Indian kind, *cyperus rotundus*
nostras.

The Indian round cyperus is a knobbed root, full of small
specks and tubercles, brown on the outside, and greyish
within, of a slightly sweet smell, and of an acrid taste. The
long cyperus is an oblong root, covered with a great number
of fibres, not easily broke, of a dusky brown without, and
a pale bright grey within, of an acrid taste, and very agree-
able smell, when fresh and good. The plants which pro-
duce them both grow in watery places, and have leaves and
flowers in some measure resembling the water-grasses, which,
from their resemblance to these, are called cyperus grasses.
They are possessed of the same virtues, cure ill-scented
breaths, are good in nephritic disorders, in colics, and in
disorders of the womb. They are taken in powder, or de-
coction.

The roots of cyperus are attenuants, and deobstruents,
promote urine, and the menses, are good stomachics, and
serviceable in the first stages of the dropsy.

CYPHANTA, in *Ancient Geography*, a town of the
Peloponnesus, in the interior of Laconia; 10 stadia from
the sea, according to Pausanias.—Also, a port of Laconia,
in the Argolic gulf, south of Prusæ. Although the town
was destroyed in the time of Pausanias, there remained a
temple of Æsculapius, with a statue of this god in marble.

CYPHARA, the name of a strong place in Theffaly,
mentioned by Livy.

CYPHER. See CIPHER.

CYPHI, a term in the *Arabian Pharmacy*, signifying a
kind of cordial perfume.

Mithridates gave the appellation cyphi to the troches
wherewith the Egyptian priests used to sweeten their gods,
to make them grant what they requested. He used the
same in the composition of mithridate, on account of their
efficacy against poisons, defluxions, &c.

The cyphi are composed of raisins, or dried grapes, tur-
pentine, myrrh, bdellium, spica nardi, cassia lignea, aspa-
lathum, saffron, &c. tempered into a mass with honey and
a little wine.

CYPHIA, in *Botany*, a genus separated by Bergius and
Jussieu from *Lobelia*, on account of its anthers being all dis-
tinct and unconnected; but that character proving of no
importance in simple flowers, this alteration has not been
generally adopted. See *LOBELIA*.

CYPHOMA, CYPHOS, and CYPHOSIS, in *Medical*
Writers, an incurvation of the spine, forming a crookedness
of the back.

CYPHON, in *Antiquity*, a kind of punishment used by
the Athenians; it was a collar made of wood, so called, be-
cause it constrained the criminal, who had this punishment
inflicted on him, to bow down his head.

CYPHONISM, CYPHONISMUS, from κυφω, which has
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various significations, derived from κυφος, *crooked*, a kind of
torture, or punishment, in use among the ancients.

The learned are at a loss to determine what it was: some
will have it to be that mentioned by St. Jerom, in his *Life*
of Paul the Hermit, chap. 2. which consisted in smearing
the body over with honey; and thus exposing the party,
with his hands tied, to the warm sun, to invite the flies and
other vermin to persecute him.

CYPHOS, in *Ancient Geography*, a town of Greece,
mentioned by Homer as furnishing 22 ships for the siege of
Troy. Steph. Byz. refers to two places under this name,
one in Theffaly, and another in Perrhæbia. He also men-
tions a river of this name.

CYPHUS, a mountain of Greece, in Perrhæbia. Strabo
and Steph. Byz.

CYPHUS, a village of Greece, in Perrhæbia. Strabo.

CYPRÆA, in *Conchology*, a genus of univalves. The
shells of this kind are involuted, subovate, smooth and ob-
tuse at each end; aperture effuse at each extremity, extend-
ing the whole length of the shell, and dentated each side.
Animal a slug. These are the cowry or gowry of English
collectors.

Species.

EXANTHEMA. Shell subturbinated, ferruginous, with
whitish round spots and ocellations; and dorsal line some-
what ramose. Linn. &c.

Native of the American and Atlantic seas.

MAPPA. Shell subturbinated, and marked with irregular
characters; dorsal line ramose. Linn. *Porcellana montosa*,
Rumpf. *Carte géographique*, Argenv.

Inhabits the Indian and African seas, and is not a common
species.

ARABICA. Shell slightly turbinated with irregular cha-
racters; dorsal stripe simple. Linn. *Porcellana literata*,
Rumpf.

Length about three inches; general colour whitish, with
irregular brown marks resembling Arabic characters. In-
habits India.

ARGUS. Shell slightly turbinated, subcylindrical, sprin-
kled with ocellated spots; beneath four brown spots. Linn.
Argus, Rumpf. *Argus magnus*, Argenv.

Native of the Indian and Atlantic seas.

TESTUDINARIA. Shell obtuse and subcylindrical, with
the extremities depressed. Linn. *Testudinaria*, Rumpf.

Inhabits the Persian gulph.

STERCORARIA. Shell somewhat turbinated, gibbous,
with livid and testaceous spots; emarginate each side, and
flat beneath.

Native of Guinea.

CARNEOLA. Shell slightly turbinated, pale with flesh-
coloured bands; mouth violet. Linn.

Inhabits the Asiatic ocean. This shell is sometimes white,
with brown bands.

ZEBRA. Shell turbinated, cinereous with brown bands.
Gmel.

Native of India.

TALPA. Shell slightly turbinated, subcylindrical, testa-
ceous with pale bands; beneath thickened and brown.
Linn. *Talpa*, Argenv.

Length from two to three inches. Native of India.

AMPHYSTEA. Shell subturbinated; sides gibbous and
decorticate; back violet. Linn. *Achatina*, Rumpf.

Native of Madagascar.

LURIDA. Shell slightly turbinated, lurid, and slightly;

the extremities pale yellow, with two black spots. Gmel. *Souris*, Argenv.

Inhabits the Mediterranean, Atlantic, and American seas.

VENELLI. Shell slightly turbinated, spotted and marked with yellowish dots; the extremities spotted with brown; throat rufous. Linn.

Native country unknown.

LOTA. Shell slightly turbinated and white, with subulate denticles. Linn.

Found in the Sicilian seas.

FRAGILIS. Shell turbinated, ovate, glaucous, with testaceous waves, and pale bands. Linn.

Inhabits the Mediterranean sea. Gualt.

GUTTATA. Shell thin gibbous, fulvous dotted with white; line in the middle horizontal; beneath white; teeth yellow. Gmel.

Described and figured by Lister. The native place not ascertained.

CINEREA. Shell thin, ventricose, reddish-grey with paler bands; mouth white. Gmel.

PLUMBÆA. Shell slightly turbinated, thin; back lead colour, with four bands varied with blue and brown, undulated with brownish at the margin, and marked with blue and brown lines. Gmel.

A rare species, found on the coast of Guinea.

OCULATA. Shell slightly turbinated; russet-brown with white ocellations, and three paler bands on the back. Linn.

Inhabits the American seas.

HISTRIO. Shell ovate, slightly turbinated, with sub-livid ocellations; beneath flat and white; sides thickened, black, spotted with brown; dorsal line livid; throat violet. Gmel.

Native of the Indian seas.

AURANTIUM. Shell somewhat turbinated; orange with white immaculate margin. Gmel.

One of the most beautiful and elegant species of its genus, and well known to English collectors under the title of *Cypræa aurora*, or morning-dawn cowry. This species was first discovered by captain Cook at the Friendly Islands, where they were observed to constitute part of the finery and ornaments of the dresses worn by the chiefs and principal natives. Only a few shells of this species have hitherto been brought to Europe, and of course bear a high price.

FERRUGINOSA. Shell thin, elongated, yellowish or blueish, with ferruginous spots; within blue. Gmel.

The native places of this and several of the following species have not been hitherto ascertained.

LIVIDA. Shell thin, elongated, uniformly straw-colour, pale yellow or reddish; beneath dotted with brown; teeth subulate. Gmel.

GIBBA. Shell thin and gibbous; back clouded and banded transversely. Gmel.

TURBINATA. Shell turbinated, ovate, and glaucous, with pale angulated spots. Gmel.

VENEREA. Shell oblong and fuscous, with striped golden spots; within blue. Bonann.

PURPURASCENS. Shell oblong, purplish; beneath furrowed with a white line. Gualt.

ALBIDA. Shell oblong, whitish; ends of the lips spotted with fulvous. Gualt.

RUFESCENS. Shell oblong, reddish-brown, beneath whitish. Gualt.

TRANSLUCENS. Shell cylindrical, cinereous, with pelucid bands. Gualt.

PUNCTULATA. Shell cylindrical, fragile, white, with transverse bands of reddish dots. Gualt.

TIGRINA. Shell obtuse, ovate, slightly turbinated, with a longitudinal testaceous line. Seba.

DUBIA. Shell oblong, ferruginous, with paler bands. Seba.

TRIFASCIATA. Shell turbinated, thin, blueish-brown, with three yellowish bands varied with brown at each end. Knorr.

A very rare species.

CONSPURCATA. Shell turbinated, blueish-white, dotted and clouded with brown. Born.

BIFASCIATA. Shell oblong, shaded with purplish, with a straw-coloured band, and another narrower white one, and a brown border. Born.

Length four inches.

CYLINDRICA. Shell cylindrical, above pale violet, and spotted with brown at the sides, and marked at each end with two brown spots. Born.

TERES. Shell cylindrical, milk-white, one side bordered and varied with a few pale yellow narrow marks; back with three brownish waved bands. Schroet.

OVATA. Shell ovate, a little depressed, one side slightly bordered; back whitish, with crowded yellowish-brown dots and waves, and three obsolete darker bands. Schroet.

MINUTA. Shell oblong, above tinged with bloom; beneath dotted with white; border on one side and teeth of the lip white; above yellow at each end; spire black at the tip. Schroet.

SANGUIOLENTA. Shell thin, oblong, barred with brown, and dotted at the sides with red. Martini.

FASCIATA. Shell turbinated, glaucous margined, above gibbous, with transverse brownish bands; throat glaucous. Chemn.

REGINA. Shell gibbous, glaucous brown, with triangular testaceous and whitish spots, and three transverse bands; throat blackish. Seba.

UNDULATA. Shell turbinated, undulated with brownish, clouded with pale ochre, and marked with deeper bands.

* *Obtuse, and without distinct Spire.*

CAPUT SERPENTIS. Shell triangularly gibbous, and rather obtuse behind. List.

Inhabits Mauritius, and Nuffatella islands. Length an inch and half.

RETICULATUM. Shell roundish, gibbous, brown, with white confluent reticulated eyes, and a white horizontal line in the middle of the back; beneath white. List.

MAURITIANA. Shell triangularly gibbous, behind depressed and acute, beneath black. Rumpf.

Native of the Asiatic isles.

VITELLUS. Shell livid, with small white spots. Rumpf. Inhabits the Indian ocean.

MUS. Shell retuse, gibbous, cinereous, with a longitudinal brown band; teeth of the aperture blackish. Rumpf.

Native of the American and Mediterranean seas. This shell is solid and slightly gibbous.

TIGRIS. Shell ovate, obtuse behind and rounded before, ferruginous, with deep brown spots, and a yellowish longitudinal dorsal line. List.

Inhabits the Indian and Asiatic ocean.

FLAMMÆA. Shell ovate, obtuse behind, and rounded before with waved yellow spots. Valenti.

A rare species; the native place unknown.

OLIVACEA. Shell ovate, olive, clouded with yellow, and spotted

C Y P R Æ A.

spotted with brown; beneath flat, pale brown; within blueish; teeth of the lip white. Martini.

FÆMINEA. Shell ovate, very thin, white, with greenish-yellow dots disposed in rows; within violet. List.

LYNX. Shell oblong-ovate with brown dots and a yellowish line; the hind part rather acute, with a rufous mouth. List.

ISABELLA. Shell subcylindrical, with pale yellow extremities. List.

Native of Madagascar.

AMBIGUA. Shell pyriform, dusky with paler clouds and spots. Seba.

SCURRA. Shell ovate-oblong, beneath flat, yellowish with greenish and livid confluent drops; the sides varied with scattered brown dots. Martini.

Native of India.

** Umbilicate, or perforated.

ONYX. Shell beneath brown, above whitish. Rumpf.

A small shell found in the Asiatic seas.

CLANDESTINA. Shell with very fine transverse lines, some concurrent. Gmel.

Native of India.

SUCCINCTA. Interior lip rounded at each extremity. Linn.

ZIZAC. Shell beneath pale yellow with brown dots, and two spots of the same at the extremities. List.

HIRUNDO. Shell above blueish, the extremities marked with two brown spots. Linn.

Inhabits the Maldiva islands.

ASELLUS. Shell white, with three fuscous bands. Linn. *Afellus*, Rumpf.

ERRONEA. Shell with an equal testaceous spot. Linn.

URSELLUS. Shell oblong white, above smooth varied with brown, and marked with two brown dots at the umbilicus or perforation. Linn.

PYRUM. Shell pale brown with paler bands and ochraceous spots, beneath and at the sides fulvous, within blue. Gualt.

MACULOSA. Shell narrow, long, with flesh-coloured spots, above varied with pale fulvous and glaucous spots, the sides chestnut. Bonan.

PULLA. Shell thin, with the sides rufous-brown; above white or pale brown with transverse bands or a paler horizontal line. Martini.

INDICA. Shell cylindrical, marked above with characters, ocellations, and a pale horizontal line; the sides bloom coloured, dotted with black; teeth of the lip brown. Rumpf.

OVUM. Shell thin, oblong, olivaceous, with scattered ferruginous spots; beneath white. Mart.

FELINA. Shell oblong, narrow, plumbeous with ferruginous dots and spots, and paler bands marked at each end with two brown spots. Seba.

ATOMARIA. Shell oblong, snowy dotted with brown; each end marked with two dusky dots. Martini.

NEBULOSA. Shell oblong, gibbous, brown with chestnut spots. Lister.

OCHROLEUCA. Shell thin, ochraceous with paler spots. Bonan.

STELLATA. Shell thin, cinereous dotted with brown, and marked with transverse elevated striæ. Bonan.

FULVA. Shell solid, oblong, fulvous with brown spots disposed in rows, and two dusky bands; the sides and under surface saffron. Gualt.

LEUCOSTOMA. Shell oblong, gibbous, clouded with

brown and blue, the sides spotted with black; mouth white. Gualt.

LUTEA. Shell brownish with two white bands, beneath pale yellow dotted with brown. Gronov.

ZONARIA. Shell ovate, smoothish, yellowish with four brown lunules. Chemn.

Inhabits the shores of Guinea, and is very rare.

*** Margined.

CRIBRARIA. Shell umbilicate, pale yellow with round white spots. Linn.—*Argus minor*. Argenv.

MONETA. Shell whitish, with nodulous margin. Linn. *Moneta Congo*, Argenv. *Moneta nigritarum*, List. *Thoracicum vulgare*, Rumpf.

Inhabits the Mediterranean, Atlantic, Ethiopic, and Indian seas. This is the species which is fished up in vast numbers by the negro females, three days before or after the full moon, and is used by the native blacks in many parts instead of money.

ANNULUS. Shell surrounded on the back with a yellow ring. Rumpf.

Inhabits Asia.

CAURICA. Shell with gibbous, unequal, whitish margin, dotted with brown, the back marked with testaceous clouds. List.

EROSA. Shell with a jagged margin, yellow dotted with white, the sides with a brownish spot. List.

Found in the Mauritius and Ascension islands.

DEROSA. Shell with a jagged margin; flesh colour, with a greenish back marked with fulvous dots, the sides dotted with brown. Gmel.

Inhabits the Mediterranean.

FLAVEOLA. Shell with a jagged margin, yellow dotted with white; the sides marked with scattered obsolete brown dots. Linn.

SPURCA. Shell slightly margined; yellow, with deeper specks, the sides dotted with brown. Linn.

Native of the Mediterranean sea.

OBLONGA. Shell oblong ovate, above blueish dotted, and spotted with brown; beneath, and at the sides white. Born.

STOLIDA. Shell cinereous, variegated with testaceous. Linn.

Length an inch and a half. This species inhabits Amboyna.

HELVEOLA. Shell triangularly gibbous, dotted with white, jagged behind, beneath yellow and immaculate. Lister.

OCELLATA. Shell slightly margined, pale yellow, with black eyes. List.

PORARIA. Shell pale violet dotted with white. Born.

PEDICULUS. Shell with numerous transverse furrows, some furcated. Linn. *Donov. Brit. Shells, &c.*

A small shell found on most sea coasts.

NUCLEUS. Shell margined each side, slightly produced and rugged, with raised tubercles above. List.

MADAGASCARIENSIS. Shell whitish, and produced each side; the back tuberculated and marked transversely with waved striæ. List.

STAPHYLÆA. Shell somewhat produced, with elevated dots, and without striæ; the extremities pale yellow. Argenv.

CICERCULA. Shell produced each side, and sprinkled with raised dots. List.

Native of the Mediterranean and Indian seas.

GLOBULUS. Shell produced each side and smooth. Rumpf.

Inhabits Amboyna.

AFFINIS. Shell oblong, slightly produced, smooth, yellow, ocellate each side below. Knorr.

Resembles the last, but is more oblong.

SQUALINA. Shell thin, oblong, white, with ferruginous dots and spots. Lill.

FIMBRIATA. Shell white, or grey, with obsolete ferruginous spots, and transverse bands; lips of the mouth marked with violet spots. Martini.

CRUENTA. Shell gibbous, above blueish, with rufous dots; beneath and at the sides white; lips citron. Gualt.

RUBIGINOSA. Shell oblong, white, within violet; back with a ferruginous blotch; each end marked with two pale yellow spots; teeth of the lips yellowish. Martini.

MILIARIS. Shell thin, short, yellowish green, with milk-white ocellations, and a lateral horizontal line. Lill.

ACICULARIS. Shell solid, above yellowish, dotted with brown, and marked with a pale horizontal line; beneath milk-white, with impressed dots at the margin. Martini.

CRASSA. Shell thick, yellowish, with three whitish bands; mouth blueish. Lill.

VINOSA. Shell above white, with a claret stain, and marked with purple eyes, surrounded with a black circle, and an horizontal white line; within blue. Bonan.

Native of the Mediterranean.

ANGUSTATA. Shell narrow, brown, with reddish spots at the sides. Gualt.

SIMILIS. Shell oblong, gibbous, yellowish, dotted with white, and marked at the margin with a black spot. Gualt.

STRIATA. Shell convex, blueish-white, dotted with brown; beneath yellow, striated on one side. Gualt.

CHINENSIS. Shell oblong, solid, variegated, with orange lips. Argenv.

PUSILLA. Shell blueish, spotted with brown, and trifasciated. Argenv.

CYPRESS. See **CUPRESSUS.**

CYPRESS. *Summer.* See **CHENOPODIUM.**

CYPRESSETA, in *Ancient Geography*, a place of Gaul, between Avelio and Arausio, according to the Itinerary of Antonine. M. d'Anville suggests that it was situated towards the bridge of Sorgue.

CYPRIÆ INSULÆ, three barren islands mentioned by Ptolemy, and placed near the island of Cyprus.

CYPRIAN, ABRAHAM, in *Biography*, born at Amsterdam about the year 1656, received the rudiments of his knowledge in medicine from his father, who practised surgery in that city. At a proper age he went to Utrecht, where he was created doctor in medicine in 1680. Having practised medicine and surgery for twelve years at Amsterdam, he was called thence to take the chair of anatomy at Franeker. In 1700 he published an account of an extra-uterine fetus, taken from one of the Fallopian tubes, where it had lain, before the parts aposthemated, twenty-one months. The woman recovered, but dying some years after, and opportunity being given to Cyprian to dissect the body, he discovered the part in which the fetus had been detained. Cyprian is said to have been very skilful and successful in cutting for the stone, having performed the operation, it is said, on no fewer than 1400 persons. In 1724 was published, in quarto, *Cystitomia Hypogastrica*, in which he gives an account of his method of operating. Haller *Bib. Anat. Eloy Dict.* Hist.

CYPRIANUS, THASCIUS CÆCILIUS, was a native of

Africa, and as some say of Carthage, where he was bishop in the third century. He was born, probably, before the end of the second century, and in the former part of his life taught rhetoric at Carthage with great applause. Such was his reputation in the exercise of his profession, that his school was frequented by a great number of young persons, who had any fortune, and who intended to be magistrates and judges, or to appear as pleaders at the bar. He was not only well acquainted with the principles and rules of eloquence, but he was also eloquent himself: and very probably composed for others arguments or pleadings, harangues or panegyrics, or such other discourses, for which he received an adequate recompence; and he thus acquired not only a competence, but a considerable degree of affluence. Upon his conversion to Christianity about the year 246, in consequence of the instruction of Cæcilius, a presbyter of Carthage, whose name he afterwards assumed, he sold his estate and distributed the produce of it among the poor. Soon after his conversion, probably in the year 247, he was made presbyter, and in the following year bishop, of Carthage. Such are the dates assigned to these events by bishop Pearson. Others, however, are of opinion, that he was baptized in the year 244 or 245, and advanced to the episcopate in 248 or 249. His advancement, whatever was the period at which it took place, was an honour which he accepted with great reluctance, at the general and earnest desire of the people of Carthage, though his election was opposed by several presbyters of that church, who afterwards gave him great uneasiness. Soon after the commencement of the Decian persecution, A. D. 250, he became extremely obnoxious to the heathen people; and they often clamorously demanded in the theatre, and other public places, that he should be thrown to the lions. This treatment constrained him to retire to some place of safety, where he continued about 14 months, and where he was diligently employed in writing those epistles, many of which are still extant. As the place of his abode was unknown, so that the hostile government was not able to find him, he was proscribed, and proclamation was made at Carthage, that if any one had any goods of Cæcilius Cyprian, bishop of the Christians, he should discover them. When the heat of the persecution abated, in the year 251, Cyprian returned to Carthage; and resuming the exercise of his episcopal office, he held several councils, two of which regulated the treatment of those who had lapsed in the persecution; and others were engaged in settling the question concerning the baptism of heretics; with regard to which Cyprian was of opinion, that all baptism out of the catholic church was null and void, and that they who had received such baptism only, ought to be baptized when they came over from heretics to the church. In one of these councils there were present 85 or 87 bishops, besides presbyters and others. It was held in 256, and its acts are still extant. About this time a pestilential distemper wasted the Roman empire, and extended its destructive ravages to Carthage. During the prevalence of this calamity, Cyprian was indefatigable in the duties of his function; and exerted himself by his discourses and influence in recommending compassion and liberality to those who were distressed. On another occasion, the virtue of Cyprian and of the people under his care, was eminently conspicuous. Several Christians were carried captives by some barbarous people of Africa, who made inroads into Numidia; for whose relief and redemption Cyprian promoted a collection, and raised a considerable sum of money, which was distributed for this purpose. His distinguished character, however, was no security against the violence of his enemies.

When the emperor Valerian became a persecutor of the Christians, Cyprian was apprehended; and having made an undisguised confession of the Christian faith before the proconsul Paternus, avouching himself, upon examination, to be a Christian and a bishop, and declaring that he knew no other gods, besides the one true God, who made the heavens, and the earth, and the sea, and all things therein; he was banished to Curubis in the year 257. On this occasion he had many fellow-sufferers, several of whom were sent to the mines, as we learn from a letter of Cyprian, written during his exile. When Galerius Maximus succeeded Paternus as proconsul of Africa, Cyprian was recalled from banishment; and restored to the possession of his gardens, or country-house, near Carthage, which he had previously sold for a sum of money that had been distributed by him among the poor. Soon after his arrival, he was ordered to appear before the proconsul at Utica, about 40 miles distant from Carthage; but having reason to apprehend a sentence of condemnation, and being desirous of dying in the presence of his own people, he absented himself from his country residence, and retired into some place of concealment. Upon the proconsul's return to Carthage, Cyprian came back to his gardens, where he was visited by several citizens of rank, who advised him to seek some retreat, in which he might be secure from the malignity of his enemies. Cyprian, however, was fully prepared for the event that awaited him; and being apprehended by a band of soldiers commissioned by the proconsul for this purpose, he attended them to the palace at Sextii, about 6 miles from Carthage. Refusing to sacrifice at the command of Galerius, the proconsul, with the advice of his council, charged him with being an enemy to the gods, and a seducer of the people, and then pronounced sentence that he should be beheaded; upon which Cyprian said "God be thanked," and he was then led away to an adjacent field, encompassed with trees, the boughs of which were loaded with spectators, where he calmly submitted to the execution of the proconsul's sentence, September 14, A. D. 258. The whole tenor of Cyprian's life after his conversion, which was peaceable, charitable, and beneficial to men of every character in distress, and the manner of his death, in which he appeared to be undaunted, ready, and willing, without seeking it, afford a very valuable testimony in behalf of the truth and excellence of the principles of the Christian religion. His character was held in such high estimation by his contemporaries and by posterity, that the day of his martyrdom was observed as a festival not only at Carthage, but also in other places both in and out of Africa. His works consist of treatises on a variety of subjects, and of Epistles. Cave. Le Clerc. Lardner.

CYPRIANUS, in *Ichthyology*, a name given by Aristotle to the carp. He also called it *cyprinus*; and Athenæus, Oppian, and many other writers, use indifferently the one or the other of the words.

CYPRINE, in *Mythology*, a surname of Venus, because the island of Cyprus was consecrated to her.

CYPRINOIDES, in *Ichthyology*, a species of *Clupea*; which see.

CYPRINUS, a genus of the abdominal kind, distinguished by having the mouth small and destitute of teeth: the gill membrane with about three rays; the body smooth and generally whitish: ventral fins often containing nine rays.

Most of the species feed on worms, insects, smaller fish, seeds, and earth, usually spawn about April or May, and are generally considered as palatable and wholesome food. Some are of the migratory kind, inhabiting both the fresh

and salt waters, while others remain in fresh waters throughout the year.

Species.

BARBUS. Anal fin with seven rays: beards of the mouth four; second ray of the first dorsal fin serrated both sides. Linn. Donovan. Brit. fishes.

A common inhabitant of most fresh waters in Europe, and easily distinguished from the other species of carp by the upper jaw being advanced far beyond the lower, and in having four appendant beards from which the appropriate name of barbus, *Angl.* Barbel, is derived. This fish during summer prefers the rapid currents and shallows of rivers, and retires at the approach of winter to the more still and deeper places. They subsist chiefly on worms, small fishes, and aquatic insects, and live in societies. Sometimes these fishes grow to the length of two or three feet, and we have instances on record of their attaining to a much larger size in some rivers in the south of Europe. Vide Donovan. Brit. fishes.

CARPIO. Anal fin nine-rayed; beards four: second ray of the dorsal fin serrated behind. Linn. Carp, Willugh. Donovan. Brit. fishes, &c.

There are two principal varieties of this fish, one having half the body covered with scales, four times as large as those of the common sort, and the other having the body destitute of scales. These fish inhabit the slow and stagnant waters of Europe and Persia, and according to popular report were introduced into England in the year 1514. The usual length of the carp in our own country is from 12 to 18 inches, but in warmer climates it often arrives at the length of two or three feet or even more. Its general colour is yellowish olive, much deeper, or browner on the back, and accompanied with a slightly gilded tinge on the sides; the fins violet brown, except the anal which is tinged with reddish.

The usual food of the carp consist of worms and aquatic insects, or when in a course of fattening for the table, bread and milk. It is an extremely prolific fish, and the quantity of roe is so great, that it is said sometimes to exceed the weight of the emptied fish itself. This fish is known to be extremely tenacious of life, and to live to a vast age, even to that of 100 or 150 years, and some writers scruple not to affirm to the age of 200 years.

The sale of carp constitutes a part of the revenue of the nobility and gentry in Prussia, Pomerania, Brandenburg, Saxony, Bohemia, Mecklenburgh, and Holstein, in all which countries the cultivation of the carp is for this reason regarded with particular attention.

GOBIO. Anal fin 11-rayed; cirri two. Linn. Gudgeon, Will. Penn. Donovan. Brit. fishes, &c.

Inhabits gentle streams and lakes of northern Europe: is tenacious of life and remarkably fertile. The length of this fish is about 10 inches at the utmost, or rarely exceeding seven or eight, and its principal food consists of herbs, worms, insects, and the fry of other fish. The colours vary according to its age, or the nature of the waters in which it lives.

TINCA. Anal fin, with about 11 rays; tail entire; body mucous; cirri two. Linn. Tench. Penn. Donovan. Brit. fishes, &c.

This fish appears to be a native of most parts of the globe, inhabiting chiefly large stagnant waters with a muddy bottom, and varying much in the tinge of its colours according to the situation in which it resides. Its general length is about 12 or 14 inches, but grows sometimes to the length of two or three feet. The usual colour is a deep blackish olive glossed with gold, the sides and abdomen yellow, belly white, and the fins dirty violaceous. The scales are very small

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small and closely affixed to the skin. The head is rather large, the eyes small, and on each side the mouth is situated a small beard. The flesh is white and soft, though well flavoured.

The supposed variety *Cyprinus Tinca auratus* of Bloch is a very beautiful fish, and is cultivated in some parts of Germany. The colour is a rich orange yellow variegated with small black spots; fins thin, transparent, and of a bright red colour; and the head rather smaller than the common tench. It is found in a state of nature in Silesia and Bohemia, and is from thence transplanted into other parts of Europe, and kept as an ornamental fish in the waters of gardens and pleasure-grounds. Like the common carp this fish delights in warmth, and is very tenacious of life.

BYNNI. Dorsal fin with 13 rays, the third thick and horny; tail linear and bifid, cirri four. Linn. Forst.

Length about 12 inches; shape oblong, with the head rather compressed; back and abdomen sloping; colour silvery; lateral line curving upwards; anal and dorsal fin red, with the base white; the rest whitish with a thickish dull-red margin. This species is a native of the Nile. The Egyptians know it by the name of Bynni, and esteem it an excellent fish for the table.

BULATMAI. Anal fin eight-rayed; second ray of the dorsal fin very large, and not serrated; cirri four. Gmel.

Inhabits the Caspian sea, and is a rare species. Its size is that of a common carp; the colour steel blue with a gloss of gold beneath, inclining to a silvery cast; scales middle size; head oblong, brownish above; lateral line straight; dorsal fin blackish; pectoral greyish with reddish tips; ventral white at the base, and red at the tip; anal red, with whitish base; tail reddish brown and furcated.

CAPOETA. Anal fin nine-rayed: third ray of the dorsal and anal fin very long, the former serrated downwards; cirri two. Gmel.

Inhabits the Caspian sea, and ascends rivers in the winter; its length is about 12 inches, the body compressed and oblong, scales rounded, moderate, smooth, striated, silvery dotted with brown, those on the belly smaller and white.

MURSA. Anal fin seven-rayed, the first very long; third ray of the dorsal fin long, thick serrated backwards beyond the middle; cirri four. Guldensit.

About 12 inches long; its habit resembles that of a pike; colour olive gilded, shaded above with dusky: abdomen white; anal and ventral fins white, spotted on the upper part with brown; the rest of the fins brown. Inhabits the Caspian sea.

CAPITO. Cirri four; third ray of the dorsal fin serrated behind; sides and lower fins whitish. Guldensit.

Much allied to the barbel, but rather more compressed, and with a longer and broader head in proportion; snout more obtuse; beards longer, and eyes larger; and the dorsal fin situated lower than in the barbel. Found in rivers running into the Caspian sea, particularly the Cyrus.

* *Tail nearly even at the end.*

CARASSIUS. Anal fin 10-rayed; lateral line straight. Linn. Crucian carp.

Length from eight to ten inches, of a deep form, very thick, colour deep olivaceous yellow with a slight silvery tinge on the abdomen; fins dull violet; the tail slightly lunated with obtuse lobes. This is a native of many parts of Europe, and inhabits ponds and large stagnant waters. The Crucian carp is considered as a coarse fish for the table in this country.

CEPHALUS. Anal fin eleven-rayed; body nearly cylindrical. Gmel.

Inhabits fresh waters of Europe, frequents deep holes of rivers, and is very shy; its principal food consists of worms and insects. Grows to the weight of five or six pounds.

GIBELIO. Dorsal fin with twenty rays: tail lunulate. Bloch.

Native of Germany and other midland parts of Europe, inhabiting lakes and rivers, and seldom exceeding eight or ten ounces in weight. The body is broad, and elongated, above blueish, the sides dull, beneath silvery, and the scales large; it is very fertile, and tenacious of life, and from its habits is an easy prey to ducks and water-fowl.

SERICIUS. Dorsal fin with ten rays; anal eleven; tail reddish brown. Gmel.

Found in great abundance in the slow and stagnant waters of Dauria. This is a small species measuring an inch and a half in length: the body shaped like the Crucian carp; the colour silvery blueish or pale violet, with a broad greenish-blue stripe each side, and pale rosy abdomen.

*** *Tail quadripartite.*

QUADRILOBUS. Sanguineous; fins rosy; tail four-lobed. Cedepe.

Described and figured by Cedepe as a species; this kind may however prove to be only a variety of the following.

**** *Tail tripartite.*

AURATUS. Anal-fin double. Gmel., &c.

This beautiful fish is a native of the southern parts of China, and is particularly found in the province of Kiang, where it exists in a natural state in a large lake situated near a mountain at a small distance from the town of Tchanghou. From this spot it is dispersed into all parts of that extensive empire, and is considered as one of the most elegant ornaments which can be introduced into the gardens and houses of persons of distinction. The Chinese ladies in particular are said to spare no pains in the cultivation of this beautiful animal.

No fish is subject to so many variations in its domestic or cultivated state as the gold fish. The most general colour is a rich and splendid golden hue, tinged with scarlet above and silvery beneath; in some the back is marked with large patches of black or blue, or sometimes the whole back is uniformly tinged with a dusky hue. The back fin is occasionally wanting, or consisting only of a few rays, and the tail varies extremely in its general form.

The gold fish has long been a favourite in this country, and breeds in our climate with almost equal facility with the carp. In a domesticated state it is fed with bread crumbs, small worms, and aquatic snails, or the yolk of eggs dried and powdered. These fishes ought not to be exposed to severe cold; they must also be supplied with a change of water, and should be kept in vessels of sufficient width to permit a free access of air, and yet so formed by curving inwards at the edges as to prevent the fish from escaping.

The gold fish is said to have been first introduced into England about the year 1691, though it was not generally known till the year 1728, when a number were brought over and presented to Sir Matthew Decker, by whom they were distributed into various parts of the kingdom.

MACROPHthalmus. Scarlet; eyes protuberant; fins half white. Bloch. Telescope carp. Shaw, Nat. Misc.

Allied to the gold fish and equally beautiful; its general colour sanguineous red; head short; eyes extremely protuberant, and appearing in some degree extensile; body covered with very large scales. This is a native of China, where it is kept in a similar manner with the gold fish, and may perhaps

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perhaps with propriety be considered as a variety of that fish.

***** *Tail bifid.*

REGIUS. Anal fin eleven-rayed; dorsal fin extending the whole length of the back. Gmel.

About the size of a herring, the body cylindrical; scales above golden, sides silvery. Inhabits the sea round Chili.

CAUCUS. Anal fin thirteen-rayed; body tuberoso, and a little silvery. Gmel.

Inhabits the fresh waters of Chili, and measures about eighteen inches in length.

MALCHUS. Anal fin eight-rayed; body conic and blueish. Gmel.

Length twelve inches. Inhabits same waters as the last.

RIVULARIS. Anal and dorsal fins eight-rayed; body spotted with brown. Gmel.

Found in small streams running down the Altaic mountains. The length of this fish is two inches; the body rather compressed and silvery; scales scarcely visible.

LABEO. Anal fin seven-rayed, dorsal eight-rayed, and pectoral nineteen. Gmel.

Inhabits the rapid and stony rivers round Dauria which discharge themselves into the Eastern sea. This fish swims rapidly and is highly prolific; its usual length rarely exceeds three feet. The body is roundish, somewhat compressed, and coated with large scales. Flesh excellent.

LEPTOCEPHALUS. Anal fin nine-rayed; dorsal eight-rayed. Gmel.

Found in the same rivers as the last, and is about the same size as the last.

CHALCOIDES. Anal fin nineteen-rayed; dorsal twelve. Gmel.

Native of the Caspian sea; about twelve inches in length; the body of a compressed form, and oblong; scales rounded and striated; colour above greyish and silvery-green, spotted with brown; the sides shining silvery, beneath milk-white.

GALIAN. Anal fin with seven, dorsal eight, and pectoral fourteen rays. Gmel.

Length three inches; body olive, spotted with brown; beneath bright red; flesh good when fried. This inhabits the stony rivers in Siberia.

NILOTUS. Anal fin with seven, dorsal eighteen rays. Gmel.

This kind inhabits the Nile; body reddish.

GONORYNCHUS. Anal fin eight-rayed; body cylindrical. Gmel.

Inhabits the Cape of Good Hope.

PHOXINUS. Anal fin with eight rays; body pellucid; tail with a dusky spot near the base. Gmel.

Found in gravelly streams in Europe and Siberia, and keeps in shoals near the surface. The species is small, scarcely ever exceeding the length of three inches; it feeds on herbs and worms, grows slowly, is very fertile, and is the favourite food of pikes.

APHYA. Anal fin with nine rays; iris red; body pellucid. Gmel.

Inhabits the northern seas of Europe; length from about two inches to four inches and a half.

LEUCISCUS. Anal fin with ten, dorsal fin with nine rays. Linn. Dace. Penn.

Lives in still deep rivers of England, France, the south of Germany, Italy, and Siberia. The casual length is about six or eight inches, but it sometimes grows to the length of eighteen inches. It feeds on worms and insects, is very fertile, and the prey of more rapacious fishes. The flesh is white, and in some estimation.

DOBULA. Dorsal and anal fins ten-rayed. Gmel.

Inhabits the fresh-water lakes of Denmark, Germany, and France; and in the spring ascends rivers, and feeds on leeches, as well as herbs. The body is narrow, oblong, above greenish, beneath silvery-blueish; the young males in milting-time spotted with black; scales moderate, and dotted at the edges with black. Length ten inches.

GRISLAGINE. Anal fin eleven-rayed; fins whitish. Gmel.

Inhabits European lakes.

IDBARUS. Anal fin twelve-rayed; ventral fins deep red. Gmel.

Found in lakes in Sweden.

RUTILUS. Anal fin twelve-rayed and reddish. Gmel., Rosch, Penn., &c.

Inhabits deep still rivers with a sandy bottom, in Europe, and adjacent parts of Asia. This fish seldom exceeds the weight of a pound and a half. It spawns in May, is very fertile, and feeds on worms and herbs; the eggs are greenish, and become red by boiling. The body is greenish-black, beneath paler; scales large and easily deciduous; flesh white and well-flavoured.

IDUS. Anal fin thirteen-rayed and red. Gmel.

Inhabits clear fresh waters in northern Europe, chiefly the larger lakes, from whence it migrates up rivers in the spring, and is sometimes found in the Caspian sea. Length from eighteen inches to two feet.

ORFUS. Anal fin thirteen-rayed; gill covers spotted with red. Gmel.

Lives in clear streams of England, Russia, and Germany; feeds on worms, insects, fat earth, and the spawn of other fishes; body above saffron; sides and belly golden-yellow, with red marks.

BUGGENHAGIA. Anal fin with nineteen rays. Gmel.

Inhabits lakes of Germany and Sweden. The body above blackish, sides compressed; scales large and silvery; flesh white. Length from twelve to fourteen inches.

ERYTHROPHthalmus. Anal fin fifteen-rayed; fins red. Gmel.

Native of northern Europe and the Caspian sea; length about twelve inches; the back greenish-black, sides greenish above the line, beneath silvery. This species is fertile, and feeds on worms, insects, and aquatic herbs. Scales large, thin, and silvery.

JESUS. Anal fin with fourteen rays; snout rounded. Gmel.

Inhabits the most rapid parts in France, Germany, Hungary, and Russia; it swims with great swiftness, and is exceedingly fertile. The body is blue above, the sides paler; the scales large, and blue at the lower edge.

NASUS. Anal fin with fourteen rays; snout prominent. Gmel.

Found in the larger lakes of Prussia, Germany, Italy, and the Caspian sea; ascends rivers in shoals in the spring; and weighs from one to two pounds. The body is oblong; blackish above, beneath silvery; the belly black within.

ASPIUS. Anal fin sixteen-rayed; lower jaw longer and incurved. Gmel.

Native of Europe and the Caspian sea; it delights in fresh and gentle streams, and grows to the weight of about twelve pounds. The flesh is white, soft, fat, and well-tasted.

BIFUNCTATUS. Anal fin with sixteen rays; lateral line red, with black spots in a double row. Gmel.

Inhabits stony rivers of Germany. This species is small, and feeds on worms and herbs; the upper part of the body is dusky-green, the sides greenish-white; scales small, and dotted with black.

AMARUS.

AMARUS. Pectoral and ventral fins with seven bony rays. Gmel.

This inhabits the same country as the preceding; the body is pellucid, silvery, above greenish-yellow, the sides above the lateral line yellow; scales dotted with black. The flesh of this fish is bitter.

AMERICANUS. Anal fin with eighteen rays. Gmel.

Native of Carolina. The body blue and silvery; lateral line arched towards the belly; tail bifid.

ALBURNUS. Anal fin with twenty rays. Linn. Bleak, Penn. Donov. Brit. Fishes.

The bleak is abundant in many of our rivers, and in those of the north of Europe in general; the flesh is in some esteem, but it is chiefly taken for the sake of its beautiful silvery scales, which artists make use of in the manufactory of artificial pearl.

This fish grows to the length of five or six inches, or sometimes even more. At certain times in the summer it is infested with a species of gordius, which increases in a short time to a vast size, and oftentimes destroys it. Fishes so infested rise to the surface of the water, where they leap and tumble about in the greatest agonies, and are known in this state to the fishermen by the name of mad bleaks.

The small fish called the white bait, and which appears in immense numbers, during the month of July, in the Thames, near Blackwall, is generally believed to be the fry of this fish; but has been lately ascertained by Mr. Donovan to be the young of the common shad. Vide Donov. Brit. Fishes. See article **CLUPEA**.

VIMBA. Anal fin with twenty-four rays; snout truncated and prominent. Gmel.

Inhabits the Baltic seas, and migrates in summer into the rivers of northern Europe. The body is silvery, above blueish, beneath tinged with green.

BRAMA. Anal fin twenty-seven-rayed; fins brown. Linn. Bream.

Inhabits lakes and still rivers in Europe and the vicinity of the Caspian sea. This fish feeds on worms and aquatic plants. In spring it approaches the shores, and ascends rivers in vast shoals with a rushing kind of noise. The body is blackish, tinged more or less with green on the upper part, the sides yellowish, belly white. The flesh is insipid, and not therefore in request.

CULTRATUS. Anal fin with thirty rays; lateral line sloping; belly very sharp. Bloch.

Native of Sweden, Prussia, and Germany. Its length is eighteen inches; the colour above grey, beneath silvery; flesh white. The species is rather scarce.

BJÖRKNA. Anal fin with thirty-five rays. Gmel.

Inhabits the lakes of Sweden, and grows to the length of five inches.

FARENUS. Anal fin with thirty-seven rays; iris yellow. Gmel.

BALLERUS. Anal fin with forty rays. Gmel.

The body of this species is thin; above dusky-blue; sides yellow, beneath silvery; belly reddish. Inhabits the lakes of Europe, and the Caspian sea.

LATUS. Very broad; anal fin with twenty-five rays. Gmel.

Inhabits in vast shoals the lakes and still rivers of northern Europe. This species is very fertile, and feeds on worms and herbs; the body thin, white, above blueish; weight about a pound; the back is arched and carinated at the anterior part.

CYPRINUS Murenula, a name given to the **SALMO Murenula**; which see.

CYPRIPEDIUM, in *Botany*, (from *Κυπρίς*, *Venus*, and

πόδιον, a *shoe*.) Ladies' slipper. Linn. Gen. 464. Schreb. 606. Willd. Sp. Pl. v. 4. 142. Juss. 65. Swartz. Orchid. 101. Class and order, *gynandria diandria*. Nat. Ord. *Orchideæ*.

Gen. Ch. *Cal.* Perianth of two leaves, one of which is erect, the other dependent; the latter often cloven. *Cor.* Petals two, alternate, with the calyx declining, often twisted; lip large, inflated, hollow, ventricose, obtuse. *Stam.* Filaments two, very short, inserted into the style, under two opposite lobes; anthers two-celled, roundish. *Pist.* Germen inferior, obovate, gibbous, twisted, with six angles; style cylindrical, with a terminal lobe, variously shaped, covering the hollow triangular stigma. *Peric.* Capsule obovate, obtusely triangular, of one cell, and three valves. *Seeds* numerous, minute, ranged along three linear receptacles.

Ess. Ch. Calyx two-leaved, spreading; lip large, inflated, hollow.

The most magnificent and admired genus of the orchis family, and distinguished from all the rest by being truly diandrous, as well as by its inflated bladder-like lip. Eight species are now enumerated by Swartz. *C. calceolus*, Engl. Bot. t. 1, is the only English one. This grows sparingly in the counties of Durham and Yorkshire; more frequently in Switzerland, in rocky, mountainous, rather shady places. *C. parviflorum*, an American kind, *Redoutè Liliac*, t. 20, is nearly related to it. The last-mentioned country probably affords several species, besides *C. spectabile* so often figured in botanical works. *C. acaule*. Curt. Mag. t. 192, is another American species, distinguished by a cleft in its lip. *C. ventricosum* of Swartz. Gmel. Sib. t. 1. f. 2, and *C. macranthos* of the same author; *Amm. Ruth. t. 21*, both natives of Siberia, have been confounded with *C. calceolus*, but very improperly, as has his *C. guttatum*. *Amm. Ruth. t. 22*, of which we have never seen specimens, except in Pallas's rich Siberian herbarium, now in the possession of A. B. Lambert, esq. V.P. L.S. *C. japonicum* is known only by Thunberg's description and figure in his *Ik. Plant. Jap.*

Such species of this beautiful genus as have been introduced into our gardens succeed tolerably well in a mixture of bog-earth with much loam, in a shady moist situation. *C. spectabile* will bear more sun, and even artificial warmth, than the rest.

CYPRIUS, or **COLBERTINUS** *Codex*, in *Biblical History*, a copy of the four gospels, brought from the island of Cyprus, and referred by Simon to the 10th century. He collated it, and his extracts were inserted in Mill's edition. Wettstein, who notes it K, in the first part of his *New Testament*, says, that it is a latinizing MS.; but Michaelis denies the charge. Montfaucon has described this MS. in his "*Palæographia Græca*," and has given a fac-simile of its characters. He refers it to the 8th century. It is written in uncial letters, with certain marks over them. It is at present in the royal library at Paris, where it is marked 63. Michaelis's *Introd.* by Marsh, vol. ii. and iii.

CYPRIUS Lapis, a kind of adamant brought from Cyprus, with which the ancients used to perforate other gems.

CYPRON, in *Ancient Geography*, a place of Judæa, in the tribe of Benjamin, built by Herod in honour of his mother, and situated in the plain of Jericho, near that city. *Joseph. Antiq. l. lxi. c. 9.*

CYPRUS, in *Geography*, an island of the Mediterranean sea, situated in the great gulf which terminates this sea to the East. N. lat. 35°. E. long. 33°. The length of this island is about 70 leagues from East to West; its greatest breadth from N. to S. is 30 leagues; and its circumference

is nearly 180. Towards the north, and at no considerable distance, are the winding coasts of Caramania, formerly Cilicia; those of Egypt, more remote, face it to the south; and the shores of Syria, on which the Mediterranean flops, are not far from it to the west. Some of the ancients thought that it formed a part of the latter continent, from which it was detached by some violent commotion of the globe, similar to that which separated Sicily from Italy, and several other islands from different parts of the continent. Dr. Woodward, however, considers this to have been an island ever since the deluge of Noah. (Nat. Hist. of the Earth, p. 112.) Pliny (H. N. l. v. c. 31.) enumerates several of the many names by which this island was distinguished. It was called *Acamis*, from one of its promontories; *Amathus*, *Paphia*, and *Salamina*, from three of its ancient cities; *Macaria*, or the fortunate island, from the fertility of its soil, the mildness of its climate, the inexpressible beauty of its plains, and the richness of its productions; *Colinia*, or *Collinia*, from its many hills; *Sphæcia*, from its ancient inhabitants, the *Sphæces*; *Ærofa*, or *Copper island*, from its copper-mines; *Ceraftis*, or *Ceraftia*, horn island, from the multitude of narrow capes or points, by which its coasts are surrounded, and which bear some resemblance to long horns projecting into the sea; and *Cyprus*, known to the Greeks under the appellation of *Kupros* and *Kupris*, which they gave to *Venus*, indicating that the worship of this goddess came to them from this island. This latter name has been derived by some from the Greek *cryptos*, signifying hidden, because the island was often concealed by the waves of the sea from the eye of the sailor; by others it is supposed to have been formed from *Cyrus*, who is said to have founded here the city of *Aphrodisia*; but 600 years before the age of *Cyrus*, in the age of *Homer*, it was known by the name of *Cyprus*. Some are of opinion, that the abundance and beauty of the copper contained in the bosom of this island occasioned its receiving the name of a metal, which, being found formerly in metallic masses, and less difficult to melt than iron, was employed, long before, for fabricating weapons and implements of agriculture. Others have discovered the origin of *Kupros*, in the name of a shrub, celebrated by the ancients, still much used among the modern Orientals, and in which the island of *Cyprus* carried on a considerable traffic. This tall shrub, called *kopher* by the Hebrews, and by the Greeks *kupros*, is the *benne*, or *hanna*, of the Arabs, and the *kanna* of the Turks; the *Lacæsonia inermis, foliis subsessilibus ovatis, utrinque acutis* of the *Linnaean* system. This shrub embellishes and perfumes with its blossoms the gardens of the island of *Cyprus*, like those of *Upper Egypt*. See the above-mentioned articles.

The principal cities of *Cyprus* were, according to *Ptolemy* and *Strabo*, on the north side of the island, *Arfinoe*, deriving the name from a queen of *Egypt*, to which country *Cyprus* had been long subject; *Solæ* or *Soli*, so called, from respect to *Solon*, the famous Athenian law-giver, in which was a famous temple consecrated to *Venus* and *Isis*; *Lapithus*, or *Lapathus*; *Aphrodisias*, *Carpæta*, *Cerines* or *Cerdunia*, and *Tremitus*:—on the eastern coast were *Salamis*, afterwards called *Constantia*, supposed to be the site of the present *Famagosta*, and the small islands *Clides*—two, according to *Strabo*, and three, according to *Pliny*;—on the south coast were *Throni*, *Citium*, *Malun*, and *Amathus*, consecrated to *Venus*, and having in its vicinity copper-mines, and a famous temple consecrated to *Venus* and *Adonis*;—on the west side of the island were *Palæpaphos*, or *Old Paphos*, where *Venus* is said to have first appeared after she was formed out of the froth of the sea,

peculiarly sacred to this goddess, and where the young women prostituted themselves to strangers that came on shore, in order to raise money for their portions, and *Neapaphos*, or *New Paphos*, famous for its harbour, and a stately temple dedicated to *Venus*, ruined by an earthquake, but re-built by *Augustus*, and called *Augusta*. The inland towns mentioned by *Ptolemy* are three; *viz.* *Chybrus*, *Tronethus*, and *Tamathus*, or *Tamafus*, to which *Strabo* adds *Lamenia*. The following cities, whose precise situation is now unknown, are mentioned by *Pliny*, *Diodorus Siculus*, *Pausanias*, *Stephanus*, and others; *viz.* *Cingria*, *Marium*, having a king of its own, *Golgi*, where *Venus* was worshipped, *Epidarum*, *Cresum*, *Erylthen*, *Lacedæmonia*, *Tegefus*, *Mefina*, *Hyle*, *Tembro*, *Le'rum*, or *Leuteon*.

By the ancient geographers, *Cyprus* was divided into four districts, or provinces; *viz.* *Paphia* to the west, *Amathæsa* to the south, *Lapitha* to the north, and *Salamina* to the east. It was afterwards divided into 12 provinces by the princes of the *Lusignan* family, who were put in possession of it by *Richard I.* of *England*, and held it for 17 generations. These twelve divisions were denominated *Nicosia*, *Famagosta*, *Paphia*, *Audima*, *Limissa*, *Maforum*, *Salines*, *Messoria*, *Crusocus*, *Pentalia*, *Carpallus*, and *Cerines*; so called from the chief cities of each district; besides which cities, and several other towns of less note, the island contained no fewer than 800 villages.

This island was first discovered by the *Phœnicians*, as we learn from *Eratosthenes* (apud *Strabonem*, lib. xiv.) about two or three generations, according to *Isaac Newton's* computation, (*Chronology* apud *Oper.* vol. v.) before the time of *Asterius* and *Minos*, kings of *Crete*; or about the year 1045. B. C. When the island was first discovered, it was, as *Eratosthenes* represents it, so overgrown with wood, that it could not be tilled; and the *Phœnicians* first cut down the wood for melting copper; but afterwards, when they began to navigate the *Mediterranean* without fear, they applied this wood to the construction of ships, and even large fleets. *Herodotus* also supposes that this island was first peopled by the *Phœnicians*. But *Josephus* says, that the descendants of *Cittim*, the son of *Javan*, and grandson of *Japhet*, were the original inhabitants of *Cyprus*, and that they laid the foundations of the city of *Citium*, the most ancient in the island. The learned *Bryant*, likewise, intimates, that the *Cnthites* (see *CYTH*) were among the first settlers in this island. *Sir Isaac Newton* also intimates, that the *Phœnicians* were accompanied in their migration by a sort of men who were skilled in the religious mysteries, arts, and sciences of *Phœnicia*, and who settled in several places under the names of *Curetes*, *Corybantes*, *Telchines*, and *Idæi Dactyli*, about the period above-mentioned. In process of time, other nations, invited by the fertility of the soil, came and settled here, *viz.* the *Phœnicians*, *Athenians*, *Salaminians*, *Arcadians*, and *Ethiopians*; for *Herodotus* says (lib. vii.) that *Cyprus* was inhabited by colonies from these different countries. The government of *Cyprus* was, without doubt, monarchical; for we find that kings reigned here in the earliest ages. The first monarch mentioned in history is *Cinyras*. (See his article.) However, *Cinyras*, and his successors, whose names are unknown, were not kings of the whole country, but only of *Paphos*, and the adjoining province. At an early period, the realm of *Salamis* was the most powerful in *Cyprus*; the *Salaminian* princes having, in process of time, subdued the whole island. Till the time of *Cyrus the Great*, the island was parcelled out among several petty kings, each of whom reigned with an uncontrolled authority. *Cyrus* subdued them by his lieutenants, and leaving them in possession of their

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their respective dominions, imposed upon them an annual tribute, and obliged them to supply him and his successor, with men, money, and ships, whenever they were required. The Cyprians continued in subjection to the Persians till the reign of Darius, the son of Hytaspes, when they made an attempt to throw off the yoke; being instigated to this revolt by a king of Salamis, about the year 460 B. C. Cimon (see his article) received a commission from the Athenians to drive the Persians from the island of Cyprus, and, in pursuance of his victories and of the articles stipulated between Artaxerxes and the Athenians, the Persians withdrew all their garrisons from the island, leaving the several kings, among whom it was parcelled out, to govern their respective kingdoms, without any dependence on the kings of Persia. Accordingly Cyprus remained free from any foreign yoke till the 18th year of Artaxerxes Mneumon, king of Persia; when it was again subjected to the Persians, together with all the Greek cities in Asia. In the year 387 B. C. Euagoras II. son of Nicoteles, who had been raised to the throne of Salamis, eminently distinguished by his natural and acquired talents, recovered the throne from which his father had been driven by a treacherous usurper; and by his valour and activity, made himself master of the greater part of the island. This prince having been assassinated by one of his eunuchs, was succeeded by his son Nicoteles; and Nicoteles again by his son Euagoras, who was expelled from the throne by his uncle Protagoras. On this occasion Euagoras joined the Persians, in hopes of recovering his crown. Cyprus had at this time nine kings, subject and tributary to the king of Persia, who all joined in the confederacy for shaking off the Persian yoke, and making themselves independent, each of them in his own city. Protagoras made a vigorous defence, and by a compromise with Ochus, the king of Persia, was confirmed in the throne of Salamis. From this time, to the reign of Ptolemy I., no mention of the Cyprian kings occurs. They all, without doubt, submitted to Alexander, upon the same terms which had been granted them by the Persian monarchs, as Arrian (*De Exped. Alex.*) seems to insinuate. Upon the death of that conqueror, and the partition of his conquests, Cyprus fell to Antigonus. But, during his absence, Ptolemy, the son of Lagus, having invaded the island with a powerful fleet, reduced the greatest part of it, and obliged the kings, who reigned there, to do him homage. From this time, 311 B. C. the kings of Cyprus should rather be called governors than sovereigns, being subjects and mere vassals to the Egyptian monarchs. Ptolemy was not long in possession of Cyprus, before Antigonus, apprized of its fertility and value, commissioned his son Demetrius to attempt the recovery of it. Accordingly, Demetrius, having raised a considerable army, and equipped a numerous fleet, invaded the island; and, after gaining several advantages, he totally defeated Ptolemy in a naval engagement, so that he was compelled to return to Egypt with the small and shattered remnant of his fleet. Upon his retreat, the whole island of Cyprus, with all the forces, shipping, and magazines, belonging to Ptolemy, fell into the hands of Demetrius. As soon as Antigonus received the news of his son's success, he assumed the title of king, and conferred it likewise on his son.

After an interval of eleven years, Ptolemy again recovered the island of Cyprus; and from this time, 293 B. C., it continued subject to Egypt, and for a short interval to Syria, till it was unjustly seized by the Romans in the year 58, B. C. Founding their pretended claim to the island on a testament of Alexander, late king of Egypt, who died at Tyre, and made the Roman people his heirs, but really wishing to gratify the private revenge of Clodius and to indulge their own insatiable avarice; the senate passed a decree for seizing Cy-

prus; and Cato was deputed to execute it by dethroning the king, who had been declared a friend and ally of Rome, and had never done any thing to incur the displeasure of the haughty and imperious republic. Cato, on his arrival, took unopposed possession of the island in the name of the republic, and seized the treasury which he found amounting to 7000 talents, or about 1,356,250*l.* sterling, which were carried to Rome, and lodged in the public treasury. From the emperors of the west, this island passed to those of the east, and became a part of the Byzantine empire. From them it was taken by the Arabs, under the reign of Heraclius. Isaac, a prince of the Comneni family, who governed it with the title of duke, fired with ambition, seized on the whole island, and established himself as its sovereign, assuming the magnificent title of emperor. The weakness of the empire for a long time favoured the views of the usurper; but in 1191, Richard I., king of England, expelled him from the sovereignty, threw him into prison, where he was confined with silver fetters, and, as some say, deprived him of his life. Being afterwards sold by this monarch to the templars, difference of religion caused the inhabitants to revolt and take up arms against their new sovereigns; upon which the knights apprehending that they should not be able to retain possession of it, surrendered it back to Richard, who conferred it on the house of Lusignan, as a compensation for the loss of Jerusalem. In 1460, Charlotte, the last heiress of Guy de Lusignan, was expelled from it by James, her natural brother. She married Louis of Savoy; and on this account the dukes of that country assume the title of king of Cyprus. After the death of James, Catharine Cornaro, his widow, having no male children, transferred the kingdom in 1480 to the republic of Venice. But the Venetians did not long enjoy their acquisition; for Sultan Selim wrested it from them in 1570; and since that epoch it has made a part of the Ottoman empire. This change of proprietors and rulers was accomplished on the part of the Ottoman forces with an attendant circumstance of savage cruelty. After having sustained six assaults and experienced the ravages of 500,000 shells, the valiant Bregadino, commander of the Venetian army, being forced to yield, capitulated Aug. 1. 1571. The conditions, previously settled, were honourable to the besieged, and worthy of their prolonged and brave resistance; but at the moment when the European general went into the tent of Mustapha, the general of Selim, in order to announce his departure, and take leave of him, the barbarian caused him to be seized, and delivered up to the most cruel tortures. He was skinned alive; then impaled; and his skin, stuffed with straw, was hung to the yard-arm of a galley, as an eternal testimony of the horrible inhumanity of the Turks, and a signal of vengeance to civilized nations.

This beautiful and productive island is divided lengthwise by a chain of mountains, the most remarkable of which is mount Olympus, or as it is called by the Greeks, Trogodos, Trobodos, or Trobos. The principal towns are Famagusta and Nicosia, the latter of which is its capital and the residence of its governor. Other towns of some note are Larnica, where the consuls and merchants of European nations fix their residence, and near which are Chiti, the ancient Citium, and the hamlet of Salterna, so called from a large lake near the sea in which salt is made; Limassol, formerly Nemofia, frequented merely on account of its harbour, in the environs of which the best wines are made, and which is the emporium of all those in the island who are concerned in trade; and Bassa or Baso, the ancient Paphos; Cerines, the ancient Ceraunia, with a bad harbour which serves, however, for the trade of the island with Caramania. On a survey of the present state of this island, and on comparing it with the accounts

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of former times, one cannot forbear regretting the pernicious and desolating influence of a despotic government. Soncini very justly observes, that the riches which are contained in its bosom, are more deeply buried by despotism than by the earth with which they are covered. The search after mines is strictly prohibited; and copper, of which it was formerly so productive, remains useless in the bowels of the mountains that contain it, as well as zinc, tin, iron, and other minerals, to the abundance of which it owed its celebrity. The mines of this island in ancient times afforded gold, but they have been for ages abandoned, and tradition can scarcely assign the places where they were found. The copper of Cyprus was in former ages the finest in the world, and its rich and primordial mines furnished the first blocks of that metal which were brought into use. The blue or azure vitriol, which still retains the name of Cyprus vitriol, was found in abundance in the copper mines. The ancient Tamassus furnished a great quantity of it, but the best was drawn from Chermesse, a village near a gulf of the same name occupying the site of Acamantis; the vitriol mines of which were wrought towards the end of the 17th century. The iron mines lie scattered, and in a quantity sufficient for the supply of the Cypriots themselves and the trade of the neighbouring countries. In the rocks is also found a very fine rock-crystal called the Bassa or Paphian diamond, from the place where it is procured. But the place is always surrounded by Turkish guards, who prevent its being carried away. Some of this crystal is likewise found in the mountains that lie in the vicinity of cape Chromachiti and of cape Alexandretta. The bowels of the high mountains contain also emeralds, amethysts, peridots, opals, &c. The Seythian jasper was deemed the best among the ancients, next to that was the Cyprian, and last of all the Egyptian. The river Pedicous, which has its source in the mountains near Nicosia, rolls down, with its limpid waters, fragments of very fine red jasper. The quarry which furnishes asbestos lies in the mountain of Acamantis, near cape Chromachiti, and it is still as plentiful as ever. Tale is common, especially near Larnica; and there are numerous quarries of plaiter. The quarries of marble afford it in quantity sufficient for building; but scarcely any are now worked but those which yield a common white marble, of little consistence. The Turk allows the unfortunate islander to trade in none of the treasures which the earth conceals but yellow ochre, umbre, and terre verte, substances common in Cyprus, and which are employed in coach-painting. The trade of coarse felt was formerly a source of considerable revenues. The salt-marsh, near the hamlet called Salterna, where it is found, was formerly three leagues in circumference; but the trade being diminished, the lake is reduced by drainage and culture to about a league in circuit. Some few country barke suffice for the conveyance of the quantity which enters into the export-trade, whereas the Venetians annually farmed it the cargo of 70 large ships. The effects of despotism are no less apparent in the productions of the surface than those of the bowels of the earth. Olive trees, in consequence of languishing culture, are much less common than they were in former times, their fruits no longer afford sufficient oil for the supply of the inhabitants, whereas it was formerly a very considerable branch of commerce. Immense reservoirs, in the form of cisterns, and coated with an impervious cement, still subsist in the environs of Larnica. Mulberry trees still form small woods in certain quarters of the island; but in several others the culture of them is utterly abandoned. The silk trade, however, though less flourishing than it was before the invasion of the Turks, is still of some importance. At Famagusta, where the market for this commodity is held,

there are annually sold about 25,000 bales, of 300lbs. each, including white silk, gold, yellow, sulphur-yellow, and orange-coloured. The floss is likewise thrown into trade, and like the silk itself, it is dispatched to the ports of Turkey or Europe. The carob, or St. John's bread-tree, furnishes pods, which are an article of considerable commerce to Syria and Alexandria. These trees are cultivated in great abundance in the environs of Limassol. Most of the plains, of which cotton constituted the wealth, still preserve some traces of that culture; the whole island now affords to commerce about 3, 4, or 5000 bales of cotton, according to the goodness of the season; whereas under the government of the Venetians, the annual quantity of these bales amounted to 30,000. Cyprus cotton is the most esteemed, as the finest of the whole Levant, and bearing a higher price. In Cyprus, the seeds of the cotton tree are sown in the month of April; when the plants appear above ground, they are thinned and weeded, and the earth is loosened about them in the course of the summer; towards the month of October the pods ripen, and the silky down which they afford is then separated from the seeds which it surrounds. A moist atmosphere, and frequent or long continued rains, are unfavourable to the cotton-tree; whereas a strong heat is very suitable to it; serving to promote the dazzling whiteness of the down, and contributing to the fineness, and substance of the silk.

At the time when the Venetians possessed the island of Cyprus, they made large plantations of sugar-canes, which succeeded as well as in Egypt, in the best districts of the island, such as that of Pincopia, on the road from Limassol to Bassa, where the best cotton in the country also grows, and near Lafca in the gulf of Pantala. Proper buildings were erected on the same spots for refining the sugar, and great advantages must have been derived from these plantations, and these sugar-refineries, in a situation so near Europe. The soil of Cyprus in various parts of it is also favourable to the vegetation of the coffee-tree, and Soncini thinks it might be here cultivated with success. The goodness of the soil is evinced by various circumstances. The gardens are full of pot herbs of a very good quality; cauliflowers are excellent, and vegetables are so abundant as to supply ships with an ample stock. Orange-trees, lemon-trees, pomegranate, and other fruit trees abound, and form groves round the habitations. Wheat and barley were formerly some of the principal articles of exportation; but now they hardly suffice for the subsistence of the inhabitants, even when they escape the destructive ravages of the grasshoppers which flock in thick clouds over the fields and dart on their produce. On their approach every kind of verdure disappears, and they even gnaw the very bark of the trees. It is therefore partly to the oppression of the government and partly to the desolating ravages of these insects, the destruction of which the Turks forbid, because they regard them as sent by the Almighty, that we are to ascribe the state of languor and almost decay of the agriculture of Cyprus. These swarms of grasshoppers, says Soncini, arrive from the continent, where, according to the opinion of M. Hessewitz, they must be formed in the midst of the deserts of Arabia, whence they depart supported and impelled by the winds. The Strait which they have to cross from the coast of Syria to cape Saint Andrea, the most eastern point of the island of Cyprus, is not more than from 20 to 25 leagues; and a gale of wind may easily carry light insects, assisting themselves with their wings, and possessing much strength and agility.

In the island of Cyprus they also gather madder, called in the Levant *al-sary*, with which cottons are there dyed red; coloquintida, which covers many fields without culture; a small quantity of cinnamon; and opium, cultivated at the

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foot of mount Olympus, and purified and packed up at Nicosia. The sandy soil of Cape Cromachiti is covered with soda, which is burnt in summer, in order to send the ashes to Europe, where it is employed in soap-manufactories. The forests also afford a fine wood for building and for planks; thence are likewise drawn tar and pitch; and the turpentine of Cyprus is more esteemed than that of any other country.

The flocks of Cyprus, that might be more numerous, afford to commerce a tolerably large quantity of wool, which passes into Italy and France. One of the productions which the Cypriots rear with the greatest attention, and which has been a beneficial branch of trade, is the famous wine which is yielded them by vines with twisting and creeping stems, and large delicious fruit. The best vines, which supply the yellowish fruits, and perfumed wine that is so much valued, occupy a district called the "Commandery," because it made a part of the great commandery of the templars, and of the knights of Malta. It is comprised between mount Olympus and the towns of Limassol and Paphos. Among the Greeks of Cyprus, there subsists a very ancient custom, which is, that when a child is born, they bury large vessels filled with wine, and closely stopped; these are not taken out of the ground but on occasion of the marriage of that same child. Part of this which remains unconsumed, is sold to Europeans, and admired for its peculiarly excellent quality. Cyprus wine is conveyed to Europe either in casks, or in those large glass bottles covered with rush or wicker, which are called *dames-jeannes*. When Cyprus wine is shipped in casks, and the price is not considered, in order to have that of the best quality, the purchaser procures casks in which has been left a certain quantity of lees, which have the property of improving the wine. Accordingly, the casks, thus provided with lees, fetch four times the price of those which are destitute of them. The wines yearly made in this island amount to near 40,000 gallons. The arts, both liberal and mechanical, find little encouragement in Cyprus. With the exception of the preparation of the leather called "Turkey-leather, or Morocco," there are scarcely any that deserve attention. This leather is prepared at Nicosia, and in the neighbouring villages: the workmen pretend to have a particular process, which they keep secret; however this be, it is certain that the leather which has passed through their hands is more lively and more brilliant in colour, and is, in general, better dressed than in other parts of Turkey. The workmen of Nicosia and its environs know how to apply dyes that are equally brilliant and durable. They also manufacture printed calicoes, the colours of which become brighter by wear and bleaching. Other cloths, half silk and half cotton, are likewise manufactured in the same places; but they fetch a high price, and are of little importance as articles of trade. In return for these productions of nature and art, the Cypriots receive woollen cloths, satins, light stuffs, laces, some metals, Indian spices, and commodities from European colonies, &c. &c. These articles of the import trade are not so numerous as they would be, if the worst of governments had not singularly diminished the population and resources of one of the finest countries of the East. Cyprus was formerly stocked with deer, roebucks, asses, wild boars, and a great number of very beautiful pheasants; but they are now all destroyed. No wild animals are seen here but foxes and hares; the odoriferous herbs on which the latter feed give their flesh an agreeable flavour. The most common of the winged tribe are rails, partridges, snipes, quails, and thrushes. Of water-fowl there is great plenty. The beccaficos and ortolans are remarkably fat, and so numerous that

they may be procured at the rate of a penny for a dozen. The oxen are lean and small; the mutton is tender and juicy; Cyprus has serpents, harmless and noxious, and also a kind of spider called tarantula.

The climate of Cyprus has been reckoned insalubrious on account of its heat and long continued drought and infrequency of rain. The heat, partly owing to the vicinity of Syria, is in summer excessive; but it is different in different parts of the island, which, being intersected from east to west by a chain of mountains, affords two different regions as well as temperatures. To the north, the winds that blow from the high mountains of Caramania, checked and repelled by those with which the island is crossed in its length, temper the heat of the summer, produce piercing colds during the winter, and preserve frozen snow on the most lofty spots, through the greater part of the year. This northern region is also, generally speaking, the most hilly, the most wooded, the most rural, and the least fertile. In the plains of the south, on the contrary, the heat of the sun, reflected by the shelves of rocks, which, in a great measure, form on this side the back of the mountains, there acts at full liberty. The north winds not being able to clear the natural barrier which the middle of the island opposes to them, do not cool the atmosphere; and without the light sea breeze which occasionally springs up and moderates the heat, it would be insupportable in certain days of the summer. Rain here is also very rare in this season, and long droughts sometimes banish an agreeable verdure, destroy the plants, attract close and innumerable columns of grasshoppers, and with the avidity thus occasioned, introduce a distressing scarcity. The irrigation of the lands is neglected by the oppressed and spiritless inhabitants, while, in some districts, stagnant waters render them an unwholesome abode. Running streams are scarce, and most rivers that flow here are mere torrents, formed by the winter rains, and the melting of the snow on the mountains, and whose beds are dry during warm weather. The abbé Mariti, who seems unwilling to acknowledge the insalubrity of Cyprus, allows that the inhabitants are very subject to intermittent fevers; but these, he observes, are easily avoided by care and temperance. In order to cure them, the Greeks take a draught of their oldest wine when they feel the access of the cold fit; and many of the Cypriots live to a very advanced age.

The Greeks, who inhabit this island, are tall and well made; their countenances and their manners are equally noble and agreeable. But their moral character is not thought to correspond with these external good qualities. They are said to be the most cunning and knavish of all the Greeks; qualities which some have ascribed to the oppressed and slavish state to which they are reduced; and even these obliquities of disposition and character are said to be counterbalanced by the hospitality, for which they are distinguished. The Cypriot is gay, says Sonnini, and a great friend to show and pleasure; but he is not the only slave whom we have seen dancing in his fetters. The women have fine eyes, but, in other respects, as Mariti informs us, are far from being beautiful:—they do not, however, degenerate from their ancestors, as votaries of that goddess, whose favourite habitation this isle was supposed to have been. In their attire they are choice; being excessively fond of flowers, as the most natural and elegant accompaniment of their other attractions; they do not dissemble their wish to please, but they manifest it with an amiable frankness. Although enjoying, perhaps, less liberty than they formerly possessed, the restrictions to which custom, or the caprice of the men subjects them, does not amount to constraint; and at least they no longer compose the disgraceful

tribute

tribute which their ancestors paid to the queens of Persia, of 50 among them, whose duty, in a haughty and despotic court, consisted in throwing themselves between the wheels of the cars, and presenting their backs to the queen, who made use of them as a footstool.

Like most places in the Levant, Cyprus is ruined by the oppressive despotism of the Turks, which counteracts the bounty of nature, and the productions of the soil, and which extends its baneful influence over fields, arts, and men; so that the curious traveller every day sees commerce fail, industry decay, lands dry up, and agriculture restrained and impoverished. Vallies, once fertile and productive, are either marked by traces of sterility, or, for want of culture, overrun with brambles and other useless or noxious plants. Population declines, and men quit a desolated country, and seek other abodes. This island was formerly governed by a *basbaev*; but the poor inhabitants, weary of his extortions, which, as they delusively imagined, were increased in order to maintain the splendour of his station, petitioned the Ottoman court to send them a *mubassil*, or governor of inferior rank:—their request was granted; but they soon found that the change of title made no alteration in the rapacity of their plunderer. The revenues are enjoyed by the grand vizir, but he farms them to the governor, who, of course, is always the highest bidder. When the island was first taken by the Turks, it contained, beside women and children, above 70,000 men, subject to annual capitation, which produced a revenue of 400,000 pialtres; the sum now exacted is much greater, though the number of contributors is scarcely a sixth part of what it then was. When a new tax is to be raised, the governor does not immediately call on the people, but sends his order by his interpreter to the archbishop, who communicates it to the bishops, and these must obtain the sum demanded from the inhabitants of their several dioceses. These taxes are often of the most absurd kind; sometimes they are laid on Christian names. The poor people are treated with the most unfeeling insolence by the governors, who do not even condescend to give their exactions a decent appearance of equity. This violence in the year 1764, occasioned an insurrection, in which the governor met with the death which he deserved from the fury of the injured people. The consequence of this was a civil war which lasted two years; but the people, being at length obliged to submit to those whom the sulan sent to succeed the deceased, their attempt to shake off the yoke only served to exasperate their tyrants, and to render their own servitude more severe. In this island there are several resident consuls; among these we find, from Mariti's account, that the British consul is invested with authority to banish any of his countrymen who shall embrace the Mahometan religion. Sonnini's Travels in Greece. Abbe Mariti's Travels in the Island of Cyprus, &c.

CYPRUS, an order of knights, called also knights of *Silence*, and knights of *the Sword*; instituted by Guy de Lusignan, king of Jerusalem and Cyprus, in 1192.

The ensign of this order was a coliar interwoven in manner of true lovers' knots, garnished with precious stones, and intermixed with the letters S and R; pendant to which was a medal of gold enamelled, with a sword, the blade environed with the letter S; round the medal was this motto, "Securitas Regni," expressing the design of the institution, which was to oppose the inroads and irruptions of the mischiefs in that island.

CYPRUS Bird, in Ornithology, a common name for the *atricapilla*, or *black-cap*, a very small bird, well known in England, and much more plentiful in the island of Cyprus,

where it is esteemed a very delicate bird at table. See *MOTACILLA*.

CYPRUS *Vitriol*. See *CYPRUS* and *VITRIOL*.

CYPRUS *Wood*, in the *Materia Medica*, a name given by some authors to the *rose wood*, because much of it is brought from the island of Cyprus.

CYPSELA, or *CYPSELLA*, in *Ancient Geography*, a town of Thrace, in the province of Rhodope, according to Thucydides, Appian, Livy, Mela, and Steph. Byz.; the last of whom places it near the river Hebrus. In the Itinerary of Antonine, it is marked between Trajanopolis and Syracella. It had been episcopal. Bellonius describes alum-works at a place called *Cypleia* or *Chypilar*; and he says, that the alum in commerce was called *alumen Lesbium*, or *di metelin*. "In some maps," says Beckmann (Hist. Inv. v. i.), "I find the names *Tysala* and *Chippilar* on the western side of the river Mariza, Maris, or Marichch, which was the Hebrus of the ancients; in others stands the name *Scapsiler* on the west bank of the sea Bouron; and it is not improbable that these may be all derived from the old *Scaptasyle* or *Scaptia Hyla*, where, according to the account of Theophrastus, Pliny, and others, there were considerable ruins."

CYPSELA, a place of the Peloponnesus, in Arcadia. Thucyd. Steph. Byz.—Also, a town of Spain, near the Mediterranean sea, and a mountain named *Celebanticum jugum*.

CYPTASIA, a town of Asia Minor, in Galatia. Ptol.

CYRA, an island of the Persian gulf. Steph. Byz.—Also, a mountain of Africa, in the Cyrenaic territory.

CYRACTICA, a name given by Strabo to an island of the Adriatic gulf, called by Ptolemy, Pliny, and others, *Curida*.

CYRANO DE BERGERAC, SAVINIEN, in *Biography*, a French author, born at Bergerac, in Perigord, in 1620. He was initiated in the art of war, and displayed a daring temper, in the number of duels which he fought. He obtained, by his general conduct, the name of "The Intrepid." At the sieges of Moulson and Arras he was wounded, which, together with his passion for literature, induced him to quit the army, for the study of philosophy and the belles lettres. Gassendi, Chapelle, and Moliere, were his instructors; and he became an author, distinguished, however, rather for the peculiarity of his works, than for those qualities which give a man distinction. He published a tragedy and a comedy, which were well received; but he is known chiefly for his "Comic History of the States and Empires of the Moon:" a burlesque piece, in which philosophy is blended with satire. In a similar style he wrote "A comic History of the States and Empires of the Sun." He left behind him, likewise, "Letters," "Discourses," and a small piece on "Physics." In his youth his conduct was licentious, and his opinions seemed to accord with his manners. An accident led him to reflection, and to a reformation of his life; but its consequences were the cause of his death, which happened in the year 1655. Moreri.

CYRASSENSIS, in *Ancient Geography*, an episcopal see of Asia Minor, in Lydia; mentioned in the Council of Chalcedon.

CYRAUNIS, a name by which Herodotus (l. iv. c. 195.) mentions an island situated on the coast of Libya, near the country of the Gyzantes; it was very narrow, and 200 stadia in length, and covered with olives and vines: it had also a lake, concerning which some fabulous stories are related.

CYRBA,

CYRBA, a town of Asia, in Pamphylia. An episcopal see of this name is mentioned in the Acts of the Council of Nice.

CYRBASIA, Κυρβασία, among the Greeks, a kind of caps with high tops, in form of a cone, which were worn by the priests.

CYRE, in *Ancient Geography*, a fountain consecrated to Apollo, in Africa, on the spot where the town of Cyrene was built, to which it gave its name.

CYRENAICA, a country of Africa, bounded on the east by Marmarica, on the west by the Regio Syrtica, on the north by the Mediterranean, and on the south by the Sahara. The ancient geographers are somewhat divided in opinion as to the extent of this country. Ptolemy says, that it extended from the promontory of Cherfontus Magnus to the gulf of the greater Syrtis; but Pliny makes its extent more considerable, bounding it by mount Catabathenos, and on the west by the Smaller Syrtis, and making it 500 miles broad. Strabo also asserts it to have extended as far as Egypt, and maintains that Marmarica lay between these two regions. This country has also been called *Pentapolis*, from its having included the five cities, Cyrene, Arsinoe or Teuchira, Berenice, Ptolemais, and Apollonia; however, this canton was only a part of Cyrenaica. Its metropolis was *Cyrene*, which see. Berenice, Teuchira, Ptolemais, Apollonia, and Adriane or Hadrianopolis, lay along the coast of the Mediterranean; and their inhabitants carried on a considerable trade.

Although a great part of Cyrenaica and the Regio Syrtica was a perfect desert, yet in both countries there were some fruitful plains. The inhabitants were subject to fevers, which have been ascribed to the insalubrity of the air. The Lathon, placed by some in Mauritania, was the only considerable river of Cyrenaica. The Montes Valsi and Anagombri are the only mountains of note; and the Palus Pahuri is the only fountain or lake. Some parts of the Cyrenaica and Regio Syrtica were famous for the production of the silphium, a plant or shrub much celebrated by the ancients. Great quantities of this vegetable were imported into Greece, and many other countries. The ancients had various modes of preparing it, both for food and for physic, as we learn from Athenæus and Hippocrates. Cyrenaica also abounded with a rich oil, as we are informed by Theophrastus. Athenæus relates, that the roses, violets, and all other flowers growing in this country, except saffron, were famous for the fragrant odours they emitted; and that, in the time of Berenice, a most valuable ointment was made of the Cyrenean roses.

The principal nations inhabiting this tract, or contiguous to it, were the Barcæi, so called from Barce or Barca, their capital, the Pphyli, and the Nasamones. The first occupiers of this country, as we learn from Herodotus, consisted of a colony brought by Battus, the Theraean, from his own country, the isle of Thera, to Platæa, an island on the coast of Libya. Hence they removed to that part of the continent that was opposite to this island, and took possession of a delightful province, watered by two rivers, and called Azirisus. By the Libyans they were conducted to Irafra, a charming country to the west of Azirisus, and here it is said, by Eusebius, they built Cyrene, about the third year of the 37th Olympiad, 650 years B. C. Aristotle says, that in his time Cyrene was a republic; and we learn from Sallust, that the people were free, and the contention took place between them and the Carthaginians about their respective limits; and that they were governed by their own laws, till the Macedonians subdued Egypt, we find asserted

by Strabo. After several conflicts with invaders, Cyrenaica was ceded to Ptolemy, and it remained subject to the kings of Egypt, till Ptolemy Physcon transferred it to his natural son, surnamed Apion, who, in the year of Rome 657, the 97th year B. C., left it by will to the Romans. The senate, instead of accepting it, permitted all the cities to be governed by their own laws; a permission which filled the country with a number of petty tyrants, who contended for power, and threw the country into confusion: but Lucullus in a great measure restored the public tranquillity, on his arrival, during the first Mithridatic war, 89 years B. C. The descendants of those Jews who had been settled here by the first Ptolemy, are said to have greatly contributed to these disturbances. The troubles of the country, however, did not terminate till it was reduced to the form of a Roman province, about 20 years after the death of Apion, and 77 B. C. Strabo says, that in his time Crete and Cyrenaica formed one Roman province. Upon a revolt, Cyrene was destroyed by the Romans; but they afterwards rebuilt it. In process of time it fell to the Arabs, and afterwards to the Turks, who are the present possessors of it.

CYRENAICI, a sect of ancient philosophers; so called from the native city of their chief, Aristippus of Cyrene, a disciple of Socrates. See ARISTIPPUS.

The distinguishing tenets of the Cyrenaic system, as far as they can be collected from the casual, and perhaps unfair, representations of prejudiced contemporaries, and from the adulterated and vague reports of later writers, are as follow:

“Perceptions alone are certain; of the external objects which produce them we know nothing. No one can be assured, that the perception excited in his mind by any external object is similar to that which is excited by the same object in the mind of another person. Human nature is subject to two contrary affections, pain and pleasure; the one a harsh, the other a gentle emotion. The emotions of pleasure, though they may differ in degree, or in the object which excites them, are the same in all animals, and universally create desire. Those of pain are, in like manner, essentially the same, and universally create aversion. Happiness consists not in tranquillity or indolence, but in a pleasing agitation of the mind, or active enjoyment. Pleasure is the ultimate object of human pursuit; it is only in subserviency to this that fame, friendship, and even virtue, are to be desired. All crimes are venial, because never committed but through the immediate impulse of passion. Nothing is just or unjust by nature, but by custom and law. The business of philosophy is to regulate the senses, in that manner which will render them most productive of pleasure. Since pleasure is to be derived, not from the past or the future, but the present, a wise man will take care to enjoy the present time, and will be indifferent to life or death.” Such a system, we may naturally suppose, would engage temporary admirers and votaries; but we may no less reasonably conclude, that, whilst it provided merely for the gratification of the senses and passions, and left human nature destitute of its noblest ornaments and highest pleasures, it would soon fall into the contempt which it deserved.

Cicero makes frequent mention of Aristippus's school; and speaks of it as yielding debauchees.

Three disciples of Aristippus, after his death, divided the sect, the doctrine of which was for some time taught by his daughter *Arete*, into three branches; under which division it languished and sunk: the first called the *Hegesiac* school; the second the *Anticarian*, and the third the *Theodoran*; from the names of their authors.

Hegesias, gloomy in his temper, and deriving from his principles no sufficient sources of happiness, became to thoroughly dissatisfied with life, that he thought it the only concern of man to avoid misery; and wrote a book to prove, that death, as the cure of all evil, is the greatest good; hence he obtained the appellation of *παραθνήσκων*, the advocate for death. *Anicerris* receded from the doctrine of his master so far as to a knowledge the merit of liberal piety, friendship, and patriotism, and to allow that a wise man might retain the possession of himself in the midst of external troubles; but he inherited so much of his frivolous taste, as to value himself upon the most trivial accomplishments, particularly upon his dexterity in being able to drive a chariot twice round a course in the same ring. *Theodorus* was a disciple of *Anicerris*, and, for the freedom with which he spoke concerning the gods, was stigmatized with the name of atheist, and banished from Cyrene. At Athens, where he took refuge, his impiety would have terminated fatally to him, if *Demetrius Phalereus* had not interposed in his favour, and introduced him to the court of *Ptolemy Lagus*. After a long interval he returned to Athens, and is said to have suffered death by hemlock; but it has been much disputed whether his offence was atheism or contempt of the Grecian superstitions. *Sextus Empiricus* (*Adv. Math.* l. ix. c. 57.) joins him to those who maintained, that the reputed gods were men, who had possessed great power on earth; and *Clemens Alexandrianus* (*Protrept.* p. 24.) expresses his surprise, that *Eumencus*, *Nicanor*, *Diagoras*, *Theodorus*, and others, who had lived virtuously, should be pronounced atheists for their opposition to Gentile polytheism. *Laert.* lib. ii. *Brueker's Hist. Philos.* by *Enfield*, vol. i.

CYRENE, now called *Cairoan*, or *Corone*, in *Ancient Geography*, a town of Africa, and capital of the country called Cyrenaica. It derived its name from the fountain Cyre, near which it stood; at the distance of 11 miles from the sea, according to *Pury*, 24 *Stadia* from *Apolonia*, which was its port. It was large and populous, and abounded with all the elegancies as well as necessaries of life. Its territory produced a great number of excellent horses; a circumstance which probably induced the Cyreneans, whether Libyans or Greeks, to apply themselves to the study and practice of every thing that related to those animals. The inhabitants of Cyrene worshipped their king, *Battus*, the founder of their kingdom. *Herod.* l. iv. c. 161. See CYRENAICA.

CYRESCHATA, a name given by *Ptolemy* to two towns of *Cyropolis*, in *Media*, and in *Sogdiana*.

CYRETLE, a town of *Macedonia*, in *Perrhæbia*; so called by *Livy*, and named *Chyretie* by *Ptolemy*.

CYRIA, an episcopal town of *Asia*, in *Syria*.

CYRIL, bishop of *Jerusalem*, was born about the year 315, ordained presbyter in 344 or 345, and bishop in 350 or 351, and died in 386. Whilst Cyril was bishop of *Jerusalem*, the emperor *Julian* is said to have proposed to the Jews the rebuilding of their temple, and as some writers have asserted, made preparations for this purpose: but the bishop, as we learn from *Rufinus* (l. i. c. 37), considering the prophecies of *Daniel*, and the words of our Lord recorded in the gospels, confidently asserted, that it could not be, that the Jews should be able to lay there, one stone upon another.

His works, now extant, are his "Epistle to the emperor *Constantinus*," mentioned by *Sozomen*, with "18 Catechetical Discourses," in which he treats of the principal subjects of the christian faith, compiled in 347 or 348, and his "5 Mystagogic Catecheses," in which he discourses con-

cerning the two sacraments of the church. *Cave's H. L.* vol. i. *Lardner's works*, vol. iv.

CYRIL, bishop of *Alexandria*, was a native of this city, and succeeded *Theophilus* as bishop of it in the year 412. The authority which had been usurped by this see, was enlarged and confirmed by Cyril; for as soon as he obtained the episcopate, he banished the *Novatians*, shut up their churches, and took away all their sacred vessels and ornaments, and deprived their bishop *Theopemptos* of his whole property. Soon after, when the Jews committed some outrages in the city, the bishop put himself at the head of the people, assaulted them in their synagogues, drove them out of the city, and permitted the christians to plunder their ellates. This conduct of Cyril displeased *Orestes* the governor, whose authority was thus invaded, and occasioned frequent skirmishes in the city. Cyril was also charged with having been accessory to a sedition, in which *Hypatia*, a famous heathen philosopher, respected and consulted by *Orestes*, was cruelly murdered; but this charge has been repelled by the advocates of the bishop. However, Cyril owed his chief fame to his dispute with *Nestorius*, against whom he maintained, that the virgin *Mary* ought to be called the mother of God. This dispute, trivial and uninteresting in its origin, terminated in a severe contest, and a general council was summoned at *Ephesus* in order to decide it. Cyril distinguished himself by a defence of the christian religion against the emperor *Julian*, consisting of 10 books, and dedicated to *Theodosius* the younger. He died in the year 444. His works are very numerous; they have been collected together and printed in Greek and Latin at *Paris* in 1538, in 6 large volumes fol. They consist of the commentaries upon the *Pentateuch*, called "Glossæ, &c." *Isaiah*, the 12 lesser prophets, and *St. John's* gospel; 17 books on the adoration and worship of God in spirit and truth, composed in form of a dialogue; dialogues on the holy and consubstantial trinity, and on the incarnation; a discourse of the orthodox faith; homilies, letters, and apologies. *Cave's H. L.* vol. i. *Dupin's E. H.* vol. iv. *Lardner's works*, vol. iii. iv. viii.

CYRILLA, in *Botany*, (named by *L'heritier* in honour of *Domenico Cyrillo M. D.* Professor of botany at *Naples*, and a very eminent physician there, who sold a sacrifice in the stormy times of the French revolution. *Linnaeus* had previously named a *cyrilla*, which proves a species of *Itea*. See *ITEA*.) *L'herit.* *Sturp.* 147. t. 71. *Willd.* *Sp. Pl.* v. 3. 229. Class and order, *didynamia angiospermia*. *Nat. Ord.* *Personate*, *Lin.*

Gen. Ch. *Cal.* Perianth superior, of five narrow leaves, permanent. *Cor.* monopetalous, funnel-shaped; tube cylindrical, curved, slightly compressed; limb spreading, five-cleft, rounded, the three lower lobes largest. *Stam.* Filaments four, inserted into the tube and included in it; the two lowermost longest, at length spiral; the others with a barren filament between them; anthers ovate, two-celled, at length confluent, whitish. *Pist.* Germen inferior, turbinate, downy; style thread-shaped, shorter than the tube; stigma two-lobed. *Peric.* Capsule imperfectly two-celled. *Seeds* numerous, minute.

Eff. Ch. Calyx five-leaved. Corolla funnel-shaped, with a spreading, five-cleft, unequal border. Anthers confluent. Capsule inferior, imperfectly two-celled, with many seeds.

Only one species is known, *C. pulchella*, *Curt. Mug.* t. 374. (*Achimenes* *Brown. Jam.* t. 30. f. 1.) a native of moist hilly places in *Jamaica*. It is herbaceous and perennial. Roots granulated and scaly. Flowers of a most vivid scarlet, extremely beautiful. Leaves ovate, serrated; named

stained with purple beneath, as well as pale and polished, like those of *Fuchsia coccinea*. It requires great stove heat, and flowers late in autumn.

CYRIUS, in *Ancient Geography*, town of Macedonia, in Emathia, inhabited by a people called Cyrrhestæ. Ptolemy.

CYRMIARÆ, a people of Thrace, mentioned by Herodotus.

CYRNABA, a gulf of Asia, placed by Pliny in Serica.

CYRNUM, an island of Greece, placed by Pliny in the vicinity of Etolia.

CYROCEPHALUS, in *Botany*, the name given by some authors to the *antirrhinum*, the calves-snout, or snap-dragon.

CYROPOLIS, in *Ancient Geography*, a town of Asia in that part of Media, called Atropatene; between the Cyrus and the Amardus; ascribed by Ptolemy to the Cadusians.—Also a town of India, mentioned by Ælian and said to have been built by Alexander.—Also, a town of Asia, in Sogdiana. Arrian says that it was built by Cyrus on the banks of the Jaxartes, and that it was taken by Alexander. He adds, that it was very large, and that its walls were very high; but that it was utterly destroyed to its very foundations. It is called *Cyra* by Strabo, and *Cyresebata* by Ptolemy.

CYRRHA, a port belonging to Crissa, a town of the Loerians, near a gulf of the same name.

CYRRHADÆ, a people of Asia in Sogdiana, who inhabited the banks of the Oxus. Ptolemy.

CYRRHÆUS, a people of Æthiopia, placed by Claudian on the banks of the Nile.

CYRRHÆSTICA, a small country of Asia, being one of the divisions of Syria; which lay between Seleucia, Commagene, and the Euphrates. It was so called from its metropolis Cyrrhus; and had 20 towns according to Ptolemy.

CYRRHUS, or *Cyrus*, a town of Asia in Syria, and capital of Cyrrhestica. Procopius says, that it was founded by the Jews, and called by its name Cyrus, in honour of Cyrus their deliverer from the captivity in Assyria. It was re-established and adorned by Justinian.—Also, a town of Greece, in Macedonia, near Pella—Thucydides.

CYRTA, a river of Gallia Narbonensis, in the territory of the Massilians.

CYRTÆA or CYRTÆ, a town situated on the banks of the Red Sea.

CYRTANTHUS, in *Botany*, (from *κυρτος*, curved, and *ανθος*, a flower), Ait. H. Kew. v. 3. 510. Willd. Sp. Pl. v. 2. 48. Class and order, *hexandria monogynia*. Nat. Ord. *Narcissi*, Juss.

Gen. Ch. *Cal.* none. *Cor.* monopetalous, club-shaped, curved; its border in six smallish, ovate-oblong, segments, of which the three outermost are rather the largest, and each tipped with a point. *Stam.* Filaments six, inserted into the tube, shorter than the corolla; anthers oblong, erect. *Pist.* Germen inferior, ovate, obtusely triangular; style thread-shaped, as long as the corolla; stigma three-cleft. *Peric.* Capsule of three cells. *Seeds* numerous.

Eff. Ch. Corolla tubular, club-shaped, curved, its limb in six ovate-oblong segments. Stamens inserted into the tube, approximated at the top.

C. angustifolius, Curt. Mag. t. 271. (*Crinum angustifolium*, Linn. Suppl. 195); and *C. obliquus*, Ait. H. Kew. v. 1. 414, Andr. Repos. t. 178. (*Crinum obliquum*, Linn. Suppl. 195, *Amaryllis Umbrella*, L'herit. Sert. t. 16.), are beautiful bulbous-rooted plants found at the Cape of Good

Hope. The former has drooping slender scarlet blossoms; the latter large pendulous ones, variegated with orange and green. Both are cultivated, either in the greenhouse or stove, like other Cape bulbs, and flower in the summer.

CYRTANTHUS, in *Gardening*, comprises plants of the bulbous rooted perennial kind; of which the species mostly cultivated are, the narrow leaved cyrtanthus, (*C. angustifolius*;) and the oblique leaved cyrtanthus.

Method of Culture.—These are a sort of plants which are capable of being multiplied either by off-sets from the roots, or by seeds; but the former is much the best method.

In the off-set method, they should be separated from the roots at the time the stems begin to decay, and be planted out in separate pots, being then put under the protection of a greenhouse or garden frame.

In the seed method, they should be sown in pots in the spring season, being immediately plunged in a moderate hot bed. And when the plants appear, and have attained sufficient growth, they should be removed into separate pots.

The plants afterwards require similar management in the different methods of raising them to other bulbous rooted kinds from the same place.

They afford a pleasing variety in greenhouse collections.

CYRTII, a people of Asia, in Media, mentioned by Strabo and Livy.

CYRTOMA, a bunch or curvity of the back. See *GIBBOUS*.

CYRTONE, in *Ancient Geography*, a town of Greece, in Bœotia, built on a mountain, according to Pausanias, who says that it had a temple of Apollo, and a wood consecrated to that deity, and also a statue to Diana.

CYRTUS, a town situated in the interior of Egypt.

CYRUS, in *Biography*, the famous founder of the Persian monarchy, and the restorer of the Jews to their country, their temple, and their former state, was the son of Cambyses, and was born about 600 years before the Christian era. It is agreed by all writers, that the mother of Cyrus was Mandana, the daughter of Astyages, the Median king; but historians are not unanimous as to the quality and description of his father. Herodotus considers him only as a private person of high rank; but Xenophon makes him sovereign of Persia, subject however to the Medes. Dr. Prideaux, who has examined with much attention the two accounts of Herodotus and Xenophon, and who is well qualified to appreciate their different merits, follows decidedly the facts detailed by the latter, because he not only wrote at all times, and on all subjects with much consideration, and a clear judgment, but having lived at the court of the younger Cyrus, was well qualified for the task which he undertook. Rollin also concurs with Xenophon in his history of this illustrious prince. Cyrus, beautiful in his person, and more amiable for the qualities of his mind, lived with his father during the first twelve years of his life, and was educated after the Persian manner in hardship and toil, and all such laborious exercises, as would tend to fit him for the fatigues of war in which he unquestionably excelled all his contemporaries. At this early period he surpassed all of his age, not only in aptness to learn, but in the courage and address with which he executed whatever he undertook. After this he was sent to Media to the court of Astyages, his grandfather, with whom he lived about five years. Here his conduct was so excellent and amiable, notwithstanding the pride, luxury, and magnificence which prevailed in the court of Media, that he was general-ly

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ly beloved, and laid the foundation of that attachment to his person which enabled him afterwards to perform the exploits which are recorded of him. He was gentle, affable, beneficent and generous. Whenever the young lords had any favour to ask of the king, Cyrus was their solicitor. If the king had any subject of complaint against them, Cyrus was their mediator; and he always managed their affairs so well, that he never failed of obtaining what he desired. When he was sixteen years of age, he accompanied Astyages in an attack upon the Assyrians, who had made inroads upon the Persian territories; his behaviour on this occasion was such, that the victory obtained was imputed to his energy and superior prowess. Soon after this he returned to his father, with whom he resided till he had attained the age of forty, when he was called forth to the assistance of his uncle Cyaxares, by whom he was appointed generalissimo of the Medes and Persians. This led to the establishment of that vast empire, of which he was the founder, and which he erected upon principles of so much wisdom, that it existed, in spite of the weakness, and the wickedness of his successors, for a period of 200 years. In this sketch we shall not attempt to follow the hero in all his contests; we have already viewed him in his conduct with regard to Cræsus, and in every instance, where valour and wisdom were required, he was found possessed of all those qualities that can render a man and a prince truly great. After a signal victory obtained by Cyrus over the Assyrians, aided by Cræsus, a young princess of exquisite beauty was found among the prisoners of war; and in the division of the spoil, she was reserved for Cyrus. Her name was Panthea, the wife of Abradates, king of Susiana. Upon the report made to Cyrus of her extraordinary beauty, he refused to see her; fearing (as he said) that such an object might engage his affection more than he desired, and divert him from the prosecution of the real design which he had in view.

When he had dethroned the Lydian king, he completed the reduction of all Lesser Asia, and Syria, and then turning his arms against the king of Assyria, he invested Babylon, which he took after a siege of two years, and thus put an end to that great and powerful monarchy, B. C. 538. See **BABYLON.**

The destruction of Babylon forms a very interesting event both in profane and sacred history; and, more particularly, in its reference to the predictions of Scripture and the subsequent state of the Jews. To the particulars that have been recited under the article **BABYLON**, we shall here subjoin some other facts that serve to ascertain the precise accomplishment of the prophecies, pertaining to this event, both as to the causes that produced it, and the consequences that resulted from it. Isaiah, who began to deliver his predictions in the year 757 B. C., and who was put to death about the year 696 B. C., and Jeremiah, who died about the year 577 B. C. expressly foretold the destruction of this city, together with several circumstances that attended it, and that marked it as a very important era in the history of the world. Both these prophets speak with such assurance of its destruction, and of the manner in which it would be brought about, that they seem to describe a future event as if it had already occurred, and they had been witnesses of the catastrophe. "Babylon," says Isaiah (xxi. 9.), "is fallen; and all the graven images of her gods he hath broken unto the ground." "Babylon," says Jeremiah (li. S.) "is suddenly fallen and destroyed, howl for her, take balm for her pain, if so she may be healed." (See *Is.* xiii. 6, 9, 15, 18, 19, 22; xiv. 23, 24. *Jer.* l. 18, 29, &c.) Cyrus, who was the destined conqueror of Babylon, and who transferred the empire from the Babylonians

to the Medes and Persians, was foretold by name above an hundred years before he was born; and that the world might not be surpris'd at the prodigious rapidity of his conquests, God condescended to declare, that he himself would be his guide, and that in all his expeditions he would lead him by the hand, and would subdue all the princes of the earth before him. It was promised that he should be a great conqueror, subduing nations before him, &c.; and accordingly he subdued kings and took several cities, extending his conquests over the whole of Asia, from the river Indus to the Ægean sea. It was also promised that he should find rich spoil among the conquered nations; and according to Pliny's account (*H. N.* l. xxxiii. c. 15.) the treasure he found in his conquests amounted to a prodigious value; nor is this surpris'ing when we consider that those parts of Asia at that time abounded in wealth and luxury; that Babylon had been heaping up treasures for many years; and that the riches of Cræsus, king of Lydia, conquered and taken prisoner by Cyrus, were in a manner proverbial. "Thus saith the Lord to his anointed, to Cyrus," &c. &c. *Is.* xlv. 1—4. The time of the reduction of Babylon was specifically marked out by the prophet Jeremiah (xxv. 11, 12.) "These nations," says he, referring to the Jews and neighbouring nations, "shall serve the king of Babylon 70 years; and it shall come to pass, when 70 years are accomplished, that I will punish the king of Babylon, and that nation, saith the Lord." This prophecy was delivered, as appears from the 1st verse of the chapter, "in the 4th year of Jehoiakim, the son of Josiah king of Judah; that was the first year of Nebuchadnezzar king of Babylon," and from that time 70 years elapsed to the taking of Babylon and the restoration of the Jews. Several circumstances relating to the siege and taking of Babylon are likewise prefigured by the prophets. It was foretold that God would stir up the Medes and Persians against it (*Is.* xxi. 2. *Jer.* l. 11); and accordingly it was besieged by the united forces of the Medes and Persians under the command of Cyrus the Persian, the nephew and son-in-law of the king of the Medes. It was foretold that various nations should unite against Babylon (*Is.* xiii. 4. *Jer.* li. 27.); and accordingly Cyrus's army consisted of various nations. Moreover it was predicted that the Babylonians should be terrified, and hide themselves within their walls (*Jer.* li. 30.), which was actually the case, both at his first and second summons. It was also foretold, that the river should be dried up before the city should be taken, an event very unlikely to happen, because it was more than 2 furlongs broad, and deeper than the height of 2 men, standing upon one another. (*Is.* xlv. 27. *Jer.* l. 38. li. 36.); and it is well known that Cyrus turned the course of the river Euphrates, which ran through the midst of the city, as we have already stated under the article **BABYLON.** It was foretold, that this city should be taken by surpris'e during a feast, (*Jer.* l. 24. li. 39. 57.) and accordingly the city was taken in the night of a great annual festival. It was predicted that the king would be instantaneously seized with horror and perturbation of mind (*Is.* xxi. 3, 4) and this, we know, was the state of Baltazar or Belsazzar, when the event occurred. (*Dan.* v. 6.) The prophecies above cited were delivered by Isaiah and Jeremiah, and the facts are related by no less historians than Herodotus and Xenophon; and Isaiah lived above 250 years before Herodotus, and near 350 before Xenophon; and Jeremiah lived above 150 years before the one, and near 250 before the other. As Cyrus took Babylon in the year 538 B. C. Isaiah delivered his prophecies at least 160 years before the taking of Babylon; and Jeremiah sent his prophecies concerning Babylon to Babylon by the hands of Seraiah,

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“in the 4th year of the reign of Zedekiah,” (Jer. li. 59.) which was 56 years before the taking of Babylon, for the 4th year of Zedekiah coincides with the year 594 B.C. That the destruction of Babylon was complete and final is no less expressly foretold and minutely described than other circumstances attending this event. For the prophecies see II. xiii. 19, &c. xiv. 22, 23, Jer. l. 13, 23, 39, 40. li. 13, 26, 29, 37, 42, 43; and for the manner in which they were accomplished, see the article B A B Y L O N.

After Cyrus had settled his affairs at Babylon, he went into Persia to make a visit to his parents who were still living, and on his way thither through Media, he there married the daughter of Cyaxares, (called in Scripture Darius the Mede) having with her as a dower the kingdom of Media in reversion, and then with his wife went to Babylon. He now (*viz.* in the year 536 B. C.) issued an edict, which has given celebrity to his name, permitting such of the Jews as were remaining from the Babylonish captivity, to return to Jerusalem and rebuild their temple. This decree was certainly obtained by the intercession of the prophet Daniel, who was already highly famed for his wisdom and integrity, in a licentious and truly infamous court. In Daniel, Cyrus seems to have placed the highest degree of confidence; which the prophet turned to the advantage of his oppressed countrymen. From concurring testimony, he no doubt pointed out to the prince the prophecies of Isaiah, in which himself was pointed out by the finger of heaven, as destined for the most important purposes; as designated to be a great conqueror, and the restorer of the Jews to their native land.

The learned Prideaux offers many reasons that might have concurred to induce the conqueror to comply with the urgent solicitations of the prophet, his friend and principal minister. Nor does the form of the edict, mentioned in the first book of Esdras, appear to us liable to the objection framed against it by an excellent biographer. Though Cyrus was born and brought up as an idolater, the interposition of providence must occasionally have made an impression on his mind, which Daniel seems to have converted to the best ends.

He speaks in his decree in the name of the lord of Israel; he was too wise to believe in the gods which his countrymen and the world in general were accustomed to worship, and was probably too much enlightened to refer the passing events of life, and the revolutions of empires, to what the ignorant would denominate chance. He had heard of the hand-writing on the wall, which none but Daniel could explain, and he only, according to his own profession, by the interposition of his God. He had been informed of the deliverance of the same excellent man from the lion's jaws, and he might be almost, if not altogether persuaded, that the God of Israel was the God that had made him “king of the whole world.”

Cyrus not only permitted and encouraged the Jews to return to their own country, but readily restored all the sacred vessels and furniture which Nebuchadnezzar had brought from Jerusalem, and deposited in the temple of Baal. Having established his empire, which was bounded on the east by the river Indus, on the north by the Caspian and Euxine seas, on the west by the Ægean sea, and on the south by Ethiopia and the sea of Arabia, upon a foundation not easily shaken; he fixed his residence in the midst of all these countries, spending generally 7 months of the year at Babylon in the winter season, on account of the warmth of that climate, 3 months at Susa, in the spring of the year, and 2 months at Ecbatana during the heat of the summer. Seven years being spent in a state of tranquillity, as he was equally beloved by his own natural

subjects, and by those of the conquered nations, he returned into Persia, which was the seventh time from his accession to the whole monarchy. At this time he was about 70 years of age; 30 of which had elapsed since his having been first made general of the Persian forces, and from the capture of Babylon, and 7 from his beginning to reign alone after the death of Cyaxares. His life had been uniformly sober and temperate, and he therefore enjoyed to the last a vigorous state of health. When he perceived that the time of his death was drawing near, he ordered his children and the chief officers of the state to be assembled near him; and, after having thanked the gods for all their favours to him during the course of his life, and implored similar protection and favour on behalf of his children, his country, and his friends, he declared his eldest son, Cambyses, his successor, and left the other, whose name was Tanaoxares, several very considerable governments. He gave them both excellent instructions, and represented to them that the main strength and support of the throne were neither the vast extent of countries, nor the number of forces, nor immense riches; but a due respect for the gods, a good understanding between brethren, and the art of acquiring and preserving true and faithful friends. After having given his hand to be kissed by all who were present, finding himself at the point of death, he added these last words: “Adieu, dear children, may your lives be happy; carry my last remembrance to your mother. And for you, my faithful friends, as well absent as present, receive this last farewell, and may you live in peace!” Having closed this address, he covered his face, and died, according to Xenophon, quietly in his bed; but if Herodotus is to be credited it was in battle, occasioned by the invasion of the Scythians. To the former opinion Dr. Prideaux, Rollin, and the writers of the Universal History, are decidedly inclined, and by this account he was at his death seventy years of age. Xenophon says that he was buried at Pasargarda, and that his monument was to be seen in the time of Alexander the Great.

Cyrus, says M. Rollin, may be justly considered as the wisest conqueror, and the most accomplished prince whose name occurs in prophane history. He possessed all the qualities requisite to form a great man; wisdom, moderation, courage, magnanimity, noble sentiments, a wonderful ability in managing men's tempers and gaining their affections, a thorough knowledge of all the branches of the military art, as far as that age had carried it, a vast extent of genius and capacity for forming, and an equal steadiness and prudence for executing the greatest projects. As real merit was the foundation and support of his greatness, he affected no self-importance and haughtiness of demeanour, but studied to render himself affable and easy of access; and he was amply compensated by the cordial affection and respect of his people. He was beloved, and had many friends, because his sentiments were kind and liberal, and he was friendly in his disposition and conduct. Cicero observes (lib. i. epist. 2. ad Q. fratrem), that during the whole time of Cyrus's government he was never heard to speak one rough or angry word; and this shewed a very singular degree of self-command. It was his invariable persuasion, that all his purposes and labours should tend to the happiness of his people. Whilst he was one day discoursing with his courtiers upon the duties of a king, he observed that a prince ought to consider himself as a shepherd; and that he ought to have the same vigilance, care, and goodness. Many great and good characters have been formed by adversity and affliction; but Cyrus was great and good without this kind of discipline. He himself informs us, that during the whole course of his life, the happiness of it was never interrupted by any unfortunate accident, and that in all his designs the success had answered

his utmost expectations. He adds, however, that in the midst of his uninterrupted prosperity, he still reserved in his heart a secret fear, proceeding from the changes and misfortunes that might happen; and this prudent fear was not only a preservative against insolence, but even against intemperate joy. As to the nature and motives of his wars and victories, M. Rollin considers Cyrus as having maintained a very different character from those conquerors who are influenced by ambition and avarice, and who are chargeable with violence and injustice. Although Cyrus was not in every respect justifiable, yet he revered the laws, and well knew that there are unjust wars, which being undertaken without just foundation, render the person concerned in exciting and producing them accountable for the blood that is shed. Cyrus's conquests were the consequences of the victories he obtained over Croesus, king of Lydia, who was master of the greatest part of Lesser Asia, and over the king of Babylon, who was master of all Upper Asia, and many other countries; both which princes were the aggressors. With good occasion, therefore, is Cyrus represented as one of the greatest princes recorded in history; and his reign justly proposed as the model of a perfect government, which it would not be, unless justice had been the basis and foundation of it; "Cyrus à Xenophonte scriptus ad justitiam imperii." Cic. l. i. epit. 1. ad Q. fratrem. Prideaux's Connection. Universal Hist. Rollin's Anc. Hist.

CYRUS, second son of Darius Nothus, king of Persia, was born about the year 423 before Christ. He was sent at the age of sixteen to govern the provinces of Asia Minor. In this situation he assumed all the haughtiness of royal birth, and inflicted the punishment of death on some of his own relations, who approached him without a due regard to the customs and ceremonies of the times. For this he was called severely to account by his father, who, on the present, and on some other occasions, was with difficulty reconciled to him. He engaged in a conspiracy against his elder brother, for which he was condemned to death, but the sentence was commuted into banishment to the provinces; being, however, of a restless disposition, as well as cruel and ambitious, he raised an immense army, under false pretences, but really with a view of attacking his brother. On the plains of Cunaxa, in the province of Babylon, he came in fight of Artaxerxes at the head of 100,000 men. Cyrus was attended by Clearchus, who advised the prince to remain in the rear; but prudence and fear were not among his qualities; he posted himself in the van; and so great was his success at the outset of the business that he was saluted king by those around him. Rushing, however, too far into danger, he was slain, at the moment when victory appeared to be deciding the fate of the day. This battle is supposed to have been fought B. C. 400. Universal History. Prideaux and Plutarch.

CYRUS, in *Ancient Geography*, one of the largest rivers in Asia. Strabo says, that it had its source in Armenia, that it ran through this country, Iberia, and Albania, and that after having received the waters of the Araxes, and of several other rivers, it discharged itself by two mouths into the Caspian sea. Ptolemy calls it *Cyrrhus*, and Plutarch *Cyrnus*. The former says that it was only a branch of the Araxes that flowed into this river, and that the other branch ran into the Hyrcanian sea. Strabo, Plutarch, and Appian say that it had two mouths; but Herodotus gives it 40.—Also, a river of Asia, in Media. Ptolemy places its mouth between the Cambyfes and the Amardus.—Also, a river of Asia, which ran through the valleys of Persia, near the Paspargadæ, according to Strabo; who adds that the king had

given it the name of Cyrus instead of its ancient appellation of Agradate. It discharged itself into the Persian gulf.—Also, an ancient town of Syria, called *CYRRHUS*; which see.—Also, a town of Greece, in the island of Eubœa.

CYSSUS, a town and port of Asia, opposite to and eastward of the town of Chios, in an island of the same name. This port is known by the victory which the Romans gained here over the fleet of Antiochus, in the year of Rome, 561. Livy, l. xxxvi. c. 44.

CYST, in *Surgery*, the bag, or membrane, in which an encysted tumor of the scirrhus, atheromatous, or sarcomatous kind, is included. In extirpating these tumors, if, by neglect, or accident, the cyst, or any considerable part of it be left behind, the tumor will not fail to return. Indeed, if the tumor be a scirrhus, the contents are hard enough to make a clear extirpation of it, notwithstanding its including coats be wounded; but when the matter of the tumor is soft, or fluid, by its escaping the tumor will become flaccid; so that it will be hardly possible to make a clear extirpation of the cyst without leaving some fragments of it behind, which must, in that case, be brought away afterwards by suppurations, digestives, and a proper treatment; and when the sinus is, by this means, cleared, the wound may be safely healed, without any danger of the return of the complaint.

CYSTICA ARTERIA; is a branch of the hepatic artery, which supplies the gall-bladder. See ARTERY.

CYSTICAPNOS, in *Botany*. See FUMARIA.

CYSTICS, denote medicines against distempers of the bladder. See STONE, LITHONTRIPTIC, &c.

CYSTICUS DUCTUS, in *Anatomy*, is the tube of communication between the gall-bladder and the hepatic duct. See LIVER.

CYSTIRRHŒA. See CATARRHUS vesicæ.

CYSTIS FELLEA, a Latin term for the gall-bladder.

CYSTIS, in *Botany*, a name by which many authors have called the *alkekengi*, or *winter-cherry*. It had this name cystis, from the remarkable character of its fruits being contained in a skinny bladder, or bag. It was generally, however, called *halicacabum*.

CYSTIS, the same with vesica or bladder.

The word is *κυστις*, which signifies the same.

CYSTIS *choleodocha*, the same with felleculus, or vesicula fellis.

CYTA, CUTATIS, in *Ancient Geography*, a town of Asia, in the kingdom of Colchis (now Mingrelia) situated at the mouth of the river Cyaneus, N. E. of Tynderis. It is said to have been the birth-place of the famous Medea, denominated from thence, by the poets, Cytzis.

CYTA, or *Cytea*, an ancient town of Scythia. Steph. Byz.

CYTEUM, SONDAG, a town of the Tauric Chersonesus, near the sea, N. E. of the promontory.—Also, a town situated on the northern coast of the isle of Crete; now called *Corax Settia*. It had been episcopal.

CYTAIS, a country of Asia, in Carmania.

CYTHARA, in *Music*. See CITHARA.

CYTHEORUM, in *Ancient Geography*, a town of Asia, in the Pontus Polemoniacus; the *Colyorum* of Pliny, and *Colyora* of Xenophon.

CYTHERA, now CERIGO, one of the Greek islands, situated in the Laconic gulf, opposite to Malca, or promontory of Laconia, from which it is distant, according to Strabo, 40 furlongs. Stephanus says, that it derived its name Cythera, from a Phœnician, called Cytherus, who settled here. Before his arrival it was called Porphyris, or Porphyrisa, as some say, because it abounded with porphy-

ry; or, as others affirm, on the authority of Aristotle, because the best scarlet was dyed here. It is about 60 miles in compass, blessed with a fruitful soil, and has several havens, one of them very safe and spacious, called anciently Scandea, about ten furlongs from the city of Cythera, situated on the southern coast of the island, and once famous for the temple of Venus, surnamed Urania, or heavenly; the most ancient and most respected temple in Greece. See CYTHEREA.

CYTHERA, a town of the island of Cyprus, supposed by some to be the present village, *Conucha*.—Also, a town of Greece, in Thessaly.

CYTHEREA, in *Mythology*, the surname of Venus, so called from the island Cythera, into which her worship was brought by the Pœnicians, and where she had a temple esteemed the most ancient in Greece. In this temple was a statue of the goddess, in complete armour, holding, like Pallas, a javelin in her hand. Upon her first springing out of the froth of the sea, for such was her origin, she is said to have been borne to the shores of this island by the Zephyrs, surrounded by the Loves, the Tritons, and Nereides, reclining in a languishing posture, in a sea-shell. They give the name of *Cytheriades* to the Graces which attended her on the shore without quitting her, except on those occasions, when she rather chiose to be waited on by the Pleasures. From this island she was carried to Cyprus; and this island, as well as Cythera, was in a peculiar manner sacred to her.

CYTHERIUM, in *Ancient Geography*, a town of Italy, situated in the interior of Oenotria; supposed to be the present *Cyrisano*.

CYTHERON, a mountain of Greece, in Bœotia, consecrated to Jupiter Cytheronius. (Pausan. l. ix. Bœotic.) In a defile of this mountain Oedipus is said to have slain his father Laius.

CYTHERUS, a river of the Peloponnesus, in the Elide, where it watered the town of Heraclea.—Pausanias says that at the source of this river there was a temple consecrated to the nymphs called *Ionides*. This river is called *Cytherius* by Strabo.

CYTHINON, in *Botany*, a name given by the ancient Greeks to the yellow wood, called also thapsum and chrysoxylon, a wood used in dyeing cloths, &c. See CYMENE. It was also called *Scythicum lignum*, Scythian wood, from the country whence it was brought; and from this last name it is easy to deduce the name cythinon. The old Greeks often wrote cythinon for scythion, and the leaving out the initial s, which was a common practice among them, reduces this word to cythinon. Familiar instances of this practice occur to us in the words milax for smilax, maragdas for fmaragdas, &c.

CYTHIUM, in *Ancient Geography*, a town of the island of Cyprus, in which Cimon died.

CYTHNUS, one of the Greek islands, distant about 12 miles E. of Ceos, and esteemed by Strabo to be one of the most fruitful islands of the Ægean sea. It was the birth-place of Cydias, an eminent painter, mentioned by Dionysius, and his commentator Eustathius. The cheese of Cythnus was, according to Stephanus and Julius Pollux, in great estimation among the ancients. This island is now called THERMIA; which see. On the southern coast there are some remains of an ancient and very magnificent city. Cythnus was also called *Ophiussa* and *Dryopis*.

CYTINA, a town of Greece, in Thessaly. Steph. Byz.

CYTINIUM, a town of Greece, in the Doride, according to Strabo, who adds, that it was one of the cities

which caused the country in which they were situated to be called *Tetrapolis*.

CYTINUS, in *Botany*, (perhaps, as Martyn suggests, “from *κύβωτος*, a name given by Theophrastus to the blossoms of the pomgranate,” whose calyx the flower in question resembles in shape.) Linn. Gen. 878. Schreb. 609. Willd. Sp. Pl. v. 4. 589. Juss. 73. Class and order, *gynandria octandria*. Nat. Ord. *Arifolochia*, Juss.

Gen. Ch. *Cal.* Perianth of one leaf, tubular, somewhat bell-shaped, coloured, permanent; its border four-cleft. *Cor.* none. *Stam.* 8; anthers sessile on the style under the stigma, oblong, 2-celled. *Pist.* Germen inferior, roundish; style cylindrical, thick, rather shorter than the calyx; stigma in 8 lobes. *Peric.* Berry globose, crowned with the calyx of 8 cells. *Seeds* numerous, minute.

Ess. Ch. Style 1. Calyx superior, 4-cleft. *Cor.* none. Anthers 8. Berry of 8 cells. *Seeds* many.

The only known species is *C. hypocistis*, Rape of Cistus, a fleshy pale-yellowish plant, parasitical on the roots of several species of *Cistus* in the south of Europe. It is figured in the wooden cuts of many old authors, also in *Cavan. Ic. t. 171*. Its qualities are said to be of an astringent nature.

CYTIS, in *Ancient Geography*, the name given by Pliny to an island which he places at the entrance of the Red sea.

CYTISO GENISTA, in *Botany*. See GENISTA.

CYTISUS, (*κύβωτος* of the ancient Greeks.) Linn. Gen. 378. Schreb. 499. Willd. Sp. Pl. v. 3. 1118. Juss. 354. Class and order, *diadelphia decandria*. Nat. Ord. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* of 1 leaf, bell-shaped, obtuse at the base; upper lip of 2, lower of 3 teeth. *Cor.* papilionaceous; standard ovate, erect, reflexed at the sides; wings as long as the standard, straight, obtuse; keel swelling, pointed, of 2 petals. *Stam.* Filaments in 2 sets (single and nine-cleft), ascending; anthers roundish. *Pist.* Germen oblong, compressed; style ascending; stigma obtuse. *Peric.* Legume oblong, taper at the base, of 1 cell. *Seeds* several, kidney-shaped, compressed.

Ess. Ch. Calyx 2-lipped; the upper of 2, lower of 3; teeth. Legume of 1 cell, with several seeds, taper at the base.

The species are very numerous, shrubby, without thorns; their leaves ternate; their flowers copious, generally yellow; except *C. purpureus*, an elegant Austrian species, frequent in our gardens. *C. Laburnum*, so commonly cultivated, even in towns, is a native of Austria, Switzerland, &c. Its wood is hard and valuable; its bunches of flowers most ornamental; but its seeds bitter and poisonous. Hares and rabbits are particularly fond of the leaves and bark. *C. sessilifolius* is a smaller, but very pretty and also hardy species. *C. Cujan* is a tropical shrub, which but ill accords with this genus.

CYTISUS of Virgil. See *MEDICAGO arborea*.

CYTISUS, in *Gardening*, comprehends plants of the evergreen and deciduous flowering shrubby kinds; of which the species chiefly cultivated are, the laburnum, (*C. laburnum*) the common cytissus, (*C. sessilifolius*), and the hairy evergreen cytissus, (*C. hirsutus*.)

Method of Culture.—These are plants which are all capable of being increased by seeds, and many of them by cuttings and layers likewise.

In the first mode the seeds should be sown, either on beds, or, where the plants are to remain, in the spring, as about March, being in this way, when of sufficient growth, transplanted into nursery-rows, to remain till of a proper
size

size for being planted out in the situations where they are to grow. When sown where they are to remain, they only require to be kept perfectly free from weeds, and trimmed to one good plant in a place, giving the tender forts the protection of mats during the severity of the winter-season.

The trees of most of the forts affords seeds in abundance in the autumnal season. In the cuttings method, they should be made from the young shoots, ten or twelve inches in length, and planted out in a rather moist, shaded situation, either in the early autumn or spring months, in rows twelve or eighteen inches apart, and eight or ten in the rows. They mostly become well rooted in the course of twelve months; and would then be kept perfectly clear of seeds till removed.

The layers may be laid down either in the summer, autumn, or spring seasons; and when the plants are well rooted, they should be taken off, and planted out in nursery-rows, as described above, for the other methods.

In the management in the nursery they only require to be preserved from the injury of weeds, and to have the land dug well between the rows annually in the autumn, till they are removed; being suffered to take their natural growth in a great measure while there.

Most of the forts are hardy, and succeed well in almost any soil or situation. The third fort should have a dry soil, and sheltered situation, as it is liable to be injured by frost. It may also be planted in pots, and placed in the greenhouse, during the winter-season, when necessary.

They are all plants which are very ornamental for the borders, clumps, and other parts of ornamented grounds; affording much variety by their numerous beautiful bunches of flowers. The large forts should be placed towards the back parts, and those of less growth towards the fronts and more conspicuous parts of such situations.

CYTNI, in *Ancient Geography*, a people placed by Ptolemy in the eastern part of the Upper Pannonia.

CYTONIUM, a town of Asia Minor, on the confines of Lydia and Mysia.

CYTORUS, or CYTORUM, a town situated on a part of the coast of Paphlagonia, which is inclined from the south-west to the north-east, between the promontory Carambis and Amastris. It is thought to have been founded by a colony of Milesians. According to Strabo, it had been a port of the inhabitants of Sinope. In its vicinity was a mountain, which produced a beautifully-veined box-tree. Its foundation is ascribed to Cytor, son of Phryxus; and it was one of the four towns which formed the estate of Amastris, sister of Darius, and wife of Dionysius, tyrant of Heraclea, at the time of the destruction of the Persian empire. It is mentioned by Pliny, Virgil, Suidas, and Xenophon, the latter of whom says that it was a sea-port, where the Greeks embarked; and after having navigated a day and night, they arrived at Sinope.

CYTTIUM, a town situated on the southern part of the island of Cyprus; called by Pliny and Ptolemy *Cittium*.

CYULES, a name given by William of Malmesbury, Gildas, and others, to the long galleys in which the Saxons, under the command of Cerdic, were transported to Britain. Of these galleys there were five, and the number of men conveyed by them was 15,800; and therefore they must have been very capacious, and the barbarians must have been satisfied with very inconvenient accommodations.

CYZICENE ÆCUS, or hall: a name given to apartments of a particular construction in the ancient villas, and

thus explained by Vitruvius. "They are situated towards the north, generally have a view of the garden, and have valved doors in the middle. They are of such a length and breadth, that two trichmia, with their surrounding appendages, may be placed opposite to each other. They have also valved windows on the right and left, that the garden may be seen through their openings, and their height is equal to one and a half their breadth. These Cyzicenses, or Cyzicena, were, among the ancient Greeks, what the *trichinia* and *conacula* were among the Romans.

CYZICUM MARMOR, a species of marble, so called by the ancients from the great use made of it by a statuary called Cyzicus. It was white, with fine narrow veins of black, and was called also *PROCONNESIUM marmor*.

CYZICUS, or CYZICUM, in *Ancient Geography*, a town in that part of Asia Minor which lay on the Propontis, seated on an island of the Propontis, bearing the same name, but joined to the continent with two bridges by Alexander the Great. It had two ports, which were formed so as to close themselves: one of them, called *Panormus*, was the work of nature, the other, the production of art, was called *Chytus*, from the Greek *κλύω*, denoting a work formed by digging; somewhat similar to the oriental *Cothon*. One part of this city was on a plain, another towards mount Arctos. According to Pliny, it consisted of a colony of Milesians. It is said to have borrowed its name from Cyzicus, king of that island and the adjacent continent, who is said to have been killed through mistake by Jason, the Argonaut. When this city became first known to the Romans, it was one of the richest and largest in Asia: and hence was styled by Florus, the Rome of Asia, and celebrated for its walls, bulwarks, haven, marble towers, &c. Among its magnificent buildings, the chief temple is particularly celebrated by the ancients;—the whole structure was of polished marble, and the joinings covered with lines of gold; the pillars were four cubits thick, and fifty high, each of one piece. The statue of Jupiter, which stood in the temple, was of ivory, and most exquisite workmanship. In subsequent ages, this city made a glorious stand against Mithridates, who lost under its walls no fewer than 300,000 men, and after all failed to reduce it. At this time it was distinguished by wise laws, a naval power of 200 gallees, and three arsenals of arms, of military engines, and of corn. (Strabo, l. xii.) But in the year 365, the city and island of Cyzicus were constrained after an honourable defence, to yield to the power of Procopius, aided by the Gothic princes. However, the ancient inhabitants of this city and island were generally deemed a cowardly and effeminate race; inasmuch that a man of a timorous disposition was contemptuously called a "Cyzican." Cicero represents them as a quiet and inoffensive people, unaccustomed to ambitious machinations against the neighbouring nations, and willing to sacrifice every thing to the enjoyment of the sweets of peace.

The current coins of this island, called stater, weighing 18 drams, were engraved with such exactness, nicety, and skill, that they were looked upon in ancient times as a miracle of art. Thence originated the Greek proverb *Κιζικονια σαφαις*, an expression used in commending any eminent performance in the art of engraving; as if the Cyzican statues were the utmost effort of that art. This coin represented on one side Cybele, the great mother of the gods, and a lion on the other; which has induced some to think that the above-mentioned proverb was a taunt on those who boast of their prowess, and affect to appear like lions, though they be in reality as timid and fearful as women. (Erasm. *Cilind.*)

The

The inhabitants of Cyzicus made pretensions to very high antiquity; and believed that their city had been given by Jupiter to Proserpine for her dowry, on which account they worshipped her as their chief deity. Appian (in Mithrid.) has particularly described the beauty, magnitude, riches and laws of this city. It was ruined by an earthquake; and the fallen marbles and pillars were conveyed to Constantinople, for the embellishment of that city. Under the Romans it was the metropolis of the consular Hellefpont, and a metropolitan see under the patriarchate of Constantinople; but it is now little better than a village, known under the names of Chizico, Spiga, and Palormi.

CZACHEC, in *Geography*, a town of Lithuania, in the palatinate of Brzesc: 25 miles E.N.E. of Brzesc.

CZACSANICH, a town of Poland, in the palatinate of Braclaw, 38 miles S. of Braclaw.

CZAR, a title of honour assumed by the grand-dukes, or, as they are now styled, emperors of Russia.

The natives pronounce it *tzar*, or *zaar*; and this, as some have supposed, by corruption from Cæsar, emperor; from some fancied relation to the Roman emperors; on account of which they also bear the eagle as a symbol of their empire.

When the czar, Peter I., required his imperial title to be acknowledged by the court of Vienna, there was great difficulty made about it: but the czar shewing them, by his ambassador, an original letter of Maximilian I. to the czar John Basilowitz, the count Zinzendorff, grand chancellor of the court of Vienna, caused the archives of the house of Austria to be searched for the original of that letter; but no such letter was found: however, the hand-writing of the secretary, and the signature of Maximilian, being known and acknowledged, the title of emperor was allowed to Peter and his successors, which they continue to enjoy. This anecdote, M. l'Abbé Langlet acknowledges to have received from count Zinzendorff himself, 1722. Encycl.

It is generally affirmed, that John Basilowitz, or Iwan Vassilievitch, declared himself czar in the year 1547; though this title is expressly attributed in history to Russian sovereigns of a period far more remote; whether it was actually borne by them, or whether the old annalists added it merely to signify, indiscriminately, a monarchical dignity, or modern historians have arbitrarily applied it to them without sufficient reason. We are told by Lomonosof, in his ancient Russian history, that Vladimir, the Saint, who died in 1015, on his marriage with the Greek princess, took upon him the title of czar. The same author says, in his abridged chronicle, that not only Vladimir Vsevolodovitch Monomachus, who began his reign in 1114, was crowned czar of all Russia; but also that Vassilly Ivanovitch, who died in 1535, first wrote himself in the last year of his reign, czar and self-holder of all Russia. With regard to the derivation of the term czar or tzar, it has been alleged, that, in the Russian bible, it denotes a king; yet the ancient Russian writers make use of it also when speaking of the Greek emperors. Moreover, the derivative *tzarstvo* means kingdom; thus, in the pater-noster, *tzarstvoe tvoe*, thy kingdom; but also, in general, it signifies empire; and it is even used in the kingdoms of nature.

M. Sperlingius, in his dissertation on the majesty of the name *konning*, observes, that the Russian princes never bore the name *czar*, till their people had embraced the Greek faith: before that time, he says, they were called *konger*, KING.

The Russians are the only persons who by czar denote a sovereign; and Mr. Tooke, as to the etymology of the word, thinks it scarcely imaginable that it has been formed by an abbreviation of Cæsar and Tzesar; for, throughout

the New Testament, where the word occurs, it was rendered by *kesar*, perhaps from the Greek Bible, which came into Russia with the Christian religion; this was afterwards changed into *tzesar*, and that again has been altered into *imperator*. Mr. Tooke farther observes, that, in the old Russian year-books, mention is frequently made of Tartarian and Siberian tzars, and *tzarevitches* (tzar's sons); thus we find, among many other instances, the tzar of the golden horde, the tzar of the krim, the tzar of Kazan. This title has not been negligently introduced, and appropriated by the Russian historians; for the sovereigns of Russia have borne it since the conquest of those kingdoms, to this day, as it stands in the imperial title; "tzarina of Kazan, tzarina of Siberia, &c." We may, therefore, suppose, says Mr. Tooke, with the highest probability, that the Russian nation, on finding these tzars among the neighbouring people, borrowed the title from them, and adopted it into the Russian language, to which it is entirely foreign. Tooke's Life of Catharine II. vol. iii.

CZARLAKOW, in *Geography*, a town of Poland, in the palatinate of Kaminiac; 34 miles W.N.W. of Kaminiac.

CZARNAKI, a town of Poland, in the palatinate of Podolia; 60 miles N.N.E. of Kaminiac.

CZARNEWECYZE, a town of Lithuania, in the palatinate of Brzesc; 10 miles N.E. of Brzesc.

CZARNKOW, a small town of the grand duchy of Warsaw, which, since the peace of Tilsit, belongs to the kingdom of Saxony. It is situated in the palatinate of Posen; 26 miles N. of Posen.

CZARNOKOZYNECZIE, a town of Poland, in the palatinate of Kaminiac; 12 miles W. of Kaminiac.

CZARSKOEZELO, the famous summer residence of the sovereigns of Russia, about 30 miles from Petersburg, is situated in an open pleasant country, diversified by little hills, meadows, and woodlands. The versts, or distances, are marked on the side of the road by columns of marble, jasper, and granite; and there are 1100 globular lamps, which are lighted when the court is there.

Czarskozele owes its origin to the empress Catherine I. its embellishments to Elizabeth, and its present tasteful magnificence to Catherine II., grand mother to the emperor Alexander. The gardens are laid out in the English manner. Their principal curiosities are a small temple, containing an exquisite collection of antique and modern statues, a magnificent bath, picturesque artificial ruins, and a small town in commemoration of the acquisition of the Taurida. Storch's Picture of St. Petersburg.

CZARTORYSK, a small town of Austria, in the kingdom of Galicia and Lodomeria, or that part of Poland, which, at the final partition of the country, was allotted to the house of Austria. It has an old castle, and is situated in Volhinia, in the district of Luck, or Luceorien.

CZASLAU, a small town of Austria, situated in Bothnia, on the river Crudimka; 51 miles S.E. of Prague. It is the capital of the circle of the same name, and was built in 796. The principal church has the highest steeple in Bohemia; it contains the ashes of John Zisca, the founder of the Hussites, who was buried here in 1424.

CZASNIKI, a small town of Russia, in Lithuanian Russia, which formerly was part of Poland, in the district of Polock.

CZASTAWSK, a town of Bohemia, in the circle of Czaslau; 12 miles S.W. of Ledetsch.

CZATORISKO, a town of Poland, in the palatinate of Volhynia; 42 miles N.N.E. of Lucka.

CZATZA, a town of Hungary, on the river Kuffutsha; 10 $\frac{1}{2}$ miles N.N.E. of Vienna, and 48 N. of Cremnitz.

CZAY-KOWKA, a town of Poland, in the palatinate of Volhynia; 38 miles N.E. of Zytomiers.

CZAZIN, a town of Croatia; 20 miles S.S.W. of Novi.

CZCRAZAN, a town of Poland, in the palatinate of Braclaw; 64 miles N.W. of Braclaw.

CZCZANOW, a town of Poland, in the palatinate of Belz; 36 miles S.W. of Belz.

CZEBRYN, a town of Poland, in the palatinate of Kiow; 44 miles S.S.E. of Czerkafy.

CZECHTITZ, a town of Bohemia, in the circle of Czaflau; 10 miles S.W. of Ledetsch.

CZECZORA, a town of European Turkey, in the province of Moldavia; 14 miles E. of Jaffy.

CZEILTÉ, a town of Hungary; 20 miles W. of Topoltzan.

CZEMER, in *Medicine*, a name given by the people of Hungary, and some of the neighbouring nations, to a very troublesome distemper of the wrists, and lower part of the arms, to which the people of this part of the world are very subject. It consists of a tumour not hard, but very painful to the touch. The general method of cure is, by giving first a strong emetic, and then confining the patient to his bed, and to the use of sudorifics, which in some days carry it off. *Phil. Transf.* N^o 243.

CZENSTOCHAU, or **CZENSTOCHOW**, *Czenstokowa*, in *Geography*, a small town of the grand duchy of Warsaw, which, from the last partition of Poland, until the peace of Tilsit, belonged to Prussia, and is a province of the kingdom of Saxony. It is situated on the river Warta; 90 miles S.E. of Breslau, and 60 N.W. of Cracow. Near this place, on the Clarenberg, is a small fortress, with a convent of monks, of the order of St. Paul, the Hermit, celebrated for a picture of the Virgin Mary, which, it is pretended, was painted by the evangelist St. Luke, and which is styled the "Treasure of the Virgin," because it draws pilgrims from all quarters. Czenstochau was considered as the *Loretto* of Poland.

CZERNETZ, or **TSCHERINCK**, a town of Walachia, near the north side of the Danube; 44 miles E. of Belgrad, and 106 W. of Buchoreft.

CZERNIKOW, **CZERNIKOF**, or **TSHERNIGOW**, *Tshernigof*, a town of Russia, in Europe, formerly in the government of Kiew, but which, since the year 1781, constitutes a separate government. It is situated on the river Desna; 90 miles N.E. of Kiew, and is the see of an archbishop. N. lat. 51^o 20.

CZERNITZ, a small town of Walachia, in that part of the country which belongs to the empire of Austria.

CZERNOMITZ, a town of Hungary, on the river Gran; 11 miles N.N.W. of Bakan.

CZERNOWITZ, a town of Austria, in the kingdom of Galicia and Lodomeria, and chief place of that part of the country called the Buckowina, which became an Austrian province in 1777. It is situated on the river Pruth.

CZERNVODA, a town of European Turkey, in the province of Bulgaria; 42 miles N. of Ternovo.

CZERSKO, or **CZERSK**, a handsome town of the grand duchy of Warsaw, which, since the peace of Tilsit, is a province of the kingdom of Saxony. It is the chief place of a district of the same name, and situated on the Vistula; 24 miles S.E. of Warsaw. N. lat. 51^o 58'.

CZERWENITZA, a poor miserable village of Austria, in upper Hungary, a short day's journey from Caschau, re-

markable only for its opal mines. The rocks are formed of decomposed porphyry and trafs. The hill is some miles in extent, and has been opened in several places, and most successfully in three particular spots, where guards are stationed to prevent strangers from digging. These mines yield several different kinds of opal, some of no value to the jeweller. It is, however, supposed, that the most valuable opals which pass in commerce under the name of oriental opals are really from the mines of Czerwenitza. Tavernier, part ii. p. 293, says; "Pour ce qui est de la Hongrie, il y a une mine d'où l'on tire des Opals, et il ne s'en trouve en aucun lieu de la terre qu'en celui là." Mr. Fichtel, in his "Mineralogische Bemerkungen von den Carpathien," that is to say, mineralogical observations on the Carpathian mountains, page 595, is of the same opinion, and assures us there are papers in the archives at Caschau, which shew that, about four centuries ago, 300 men were engaged in these mines, which circumstance would account for the quantity of opals that has been for so long a time in the market.

The mines of Czerwenitza produced, perhaps, that very opal, to obtain which Anthony could proscribè a Roman senator, and to keep which a Roman senator could suffer banishment. Townson's Travels in Hungary.

CZESTIN, a town of Bohemia, in the circle of Czaflau; 13 miles from Czaflau.

CZETEZUTA, a town of European Turkey, in the province of Moldavia; 6 miles S. of Jaffy.

CZETNEK, a town of Hungary; 26 miles W. of Caschau.

CZETWERNIA, a town of Poland, in the palatinate of Volhynia; 16 miles N. of Lucko.

CZIEZER, a town of Hungary; 21 miles E. of Caschau.

CZIFFEN, a small town of Austria, in Lower Hungary, situated on an extensive plain, and formerly a place of some consequence.

CZIGLED, a town of Austria in Lower Hungary, in the district of Ketskemet. It is situated in a very fertile country, and belongs to the nuns of St. Clara at Buda. After the battle of Sicambria, it became the residence of the Zuklers, who were among the principal leaders or chiefs of the Transylvanians.

CZIGLIN, a town of Sclavonia; 7 miles N.W. of Brod.

CZIRKNITZ. See **CIRKNITZ**.

CZIRNIECHOW, a town of Poland, in the palatinate of Volhynia; 12 miles W. of Zytomiers.

CZIROKOGRODNA, a town of Poland, in the palatinate of Braclaw; 54 miles N.N.W. of Braclaw.

CZNICLOW, a town of Poland, in the palatinate of Sandomirz; 24 miles N.W. of Sandomirz.

CZOCHWIACE, a town of Poland, in the palatinate of Kiow; 4 miles S. of Bialacerkiev.

CZONGRAD, or **CZONGRODT**. See **CSONGRAD**.

CZORNOW, a town of Lithuania, in the palatinate of Brzesc; 18 miles S.S.W. of Brzesc.

CZUCKERMANDEL, a small town of Austria, in Lower Hungary, in the district of Presburg, not far from Presburg castle, inhabited chiefly by Jews.

CZUDNATZ, a town of Poland, in the palatinate of Lublin; 40 miles N.W. of Lublin.

CZUDNO, a small town of Turkey, in Europe, in Upper Moldavia, on the river Pruth.

CZUGUR, a river of European Turkey, in the province of Moldavia; which runs into the Pruth, near Stephanowze.

CZUWACHIANS,

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CZUWACHIANS, a tribe of Tartars dispersed over the right bank of the Wolga, in the government of Kafan, and extending as far as Ufa, in that of Orenburg; and, on this account, denominated Ufian Tartars. They are a very laborious people; and their number is said to amount to upwards of 100 thousand persons, inhabiting small towns, and a great number of villages. Their two chief places are Silisgorod and Kobshatsk. They acknowledge the god, named Tor, but pay almost an equal worship to the sun. They have no temples; but, in the midst of forests, pay their homage to Tor, and offer sacrifices, consisting of black lambs, which, in the lamb-season, they slaughter in such numbers as their jumak, or high priest, has ordered. The yumaski, who are priests subordinate to the jumak, possess the greatest authority among the Ufian Tartars. These are their only physicians, when any are ill; the only judges

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to whom they appeal for deciding their disputes; and the only counsellors to whom they apply for advice in affairs of moment. Like the other Tartars, they abstain from hog's flesh, and from working on Friday. They annually celebrate a kind of Easter, at a place, and on the day determined by the grand jumak. Every family repairs thither with the most profound meditation, carrying their lamb, which is killed in the name of Tor, and after the sacrifice it is eaten by those who brought it. All of them use nearly the same kind of dress, and the same kind of food with the Barshkirians, whom they also resemble in their manners. *Chontrean's Travels.*

CZYRCASSY, CZYRKASSY, or *Czircaffi*, in Latin *Czircaffia*, a small town of Russia, in Europe, in the Ukraine, situated on the Dnieper, in the government of Kiew, or Kiow; 105 miles S.E. of Kiow. It has an old castle.

END OF VOL. X.

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