

tectural effect. In these cases stability is assured by the walls being sufficiently strong to withstand the resultant horizontal pressure, or by the roof principals being of a form approximating to that of an arch.

The roof principals are usually placed at a distance of about ten feet apart. They are connected by longitudinal timbers called 'purlins,' which in their turn support the 'common' rafters on which the roof itself is laid. In roofs of large span, where the principals are necessarily heavy and costly, an economy may be effected by spacing them farther apart and strengthening the purlins (which have to bear a cross strain) by means of trussing—a method not infrequently applied also to long beams in bridges and other temporary works. Trussing consists in supporting the beam by two or more iron struts near the centre, their weight being carried by iron tension rods which have a bearing on the fixed ends of the beam. The chief objection to this is the high crushing stress which is brought on the wood where the tension rods are fixed. For temporary work, and for such particular uses as that of lengthy purlins in a large-span roof, the truss is advantageous; otherwise, it is preferable to use an iron girder for a long beam under a bending load.

*Floors.*—The timber framing which supports the flooring boards of the room above and the ceiling of the room beneath is constructed on one of three general designs. (1.) Single-joisted floors consist of only one series of joists, which rest on the wall-plate at either end. If an obstacle, such as a fireplace, intervenes, a bearing is afforded on a cross-piece, or 'trimmer,' which is mortised into the full-length joist, known as trimming joist, on each side. (2.) Double floors, which, since the

introduction of steel and concrete, are becoming obsolete, have three tiers of joists—(a) the binding joists, which are the chief supports, and which rest on the walls (as before); (b) the bridging joists above and (c) the ceiling joists below, which cross the main series and are notched into them, holding respectively the floor boards and the ceiling. (3.) Framed floors, which are becoming obsolete for the same reason as double floors, have in addition main beams, into which the binding joists are framed at intervals, instead of crossing the whole width of the room. Each variety of floor has its own use—framed floors being adapted for large spans, double floors where an even ceiling is essential, single floors for moderate-sized rooms, where strength and lightness are first considerations. The joists of single floors should, for all spans above 8 ft., be strutted together at intervals, to prevent them turning or twisting. A system of diagonal or 'herring-bone' strutting is the most efficient.

*Partitions* are frames of timber used for dividing the upper stories of a house into rooms. They are usually faced on each side with lath and plaster; or the spaces between the timber may be filled in with concrete or brickwork.

*Centres* are curved frames for supporting the arch stones of bridges or vaults during the construction of the arch. The vertical frames or 'ribs' of which centres are composed are placed from 4 to 6 ft. apart, and are connected by horizontal ties and by diagonal bracing. On them is laid the 'lagging' of narrow boards which carries the stones of the arch. The ribs are built up of a series of short timbers shaped on the outside to the curve of the arch, and supported at their junctions by radial struts. For a small span these struts con-



verge to one or more points on the tie-beam, which is, if possible, there supported by vertical posts from the ground. In the centres for a large bridge a system of trussing must be adopted by which for each rib the load of the arch is transmitted to two points at the extremities of the chord. These points rest on some fixed support, with the intervention of two or more wedges, which are driven in when the centre is first adjusted. When the arch is finally keyed in, and it is desired to strike the centres, the wedges are gradually knocked back and out, so as to let the rib down by degrees and allow the arch to take its proper bearing slowly.

*Staging and Gantries.*—The design of permanent bridges of large span, in which wooden trusses may be made to take the place of the voussoirs of a masonry arch, or the members of an iron lattice girder, comes more under the province of the engineer.

*Staging* consists of two rows of standards (squared timbers of large scantling) stiffened and braced by diagonals, and connected at the tops by longitudinal beams which serve to carry a platform or a line of rails. The bases of the standards are usually set on a sill of horizontal timber resting on the ground. Short cross pieces are fixed to their heads, so as to give a better bearing for the longitudinal 'runners,' which are also supported by diagonal struts, butting on cleats fixed to the sides of the standards. The different members of such a structure are joined together by bolts. A gantry is a staging of considerable length used to carry a travelling crane. See SHORING; also T. Tredgold's *Carpentry* (new ed. 1904), and Ellis's *Modern Practical Carpentry* (1906).

**Carpet Bedding**, in gardening. The arrangement of flowers in what are known as carpet beds is

not now practised to anything like the same extent as was the case fifty years ago. A carpet bed consists of plants mostly with brightly-coloured leaves and with insignificant flowers, arranged in definite patterns, so as to give an effect resembling that of a carpet. The patterns are usually geometrical, but occasionally attempts are made to copy the forms of birds, butterflies, and other objects. The even general surface is obtained not only by pinching the tall plants, but also by so arranging the soil that the dwarf plants stand at a higher level than the taller growers.

**Carpet, HOLY.** See KAABA.

**Carpet Knight**, originally the name given to one knighted by the king on the carpet before the throne and not on the field of battle; later applied in a contemptuous sense to a soldier who shirks active service.

**Carpet Moths**, a name given to many of the *imagines* (adults) of the Geometridæ, whose larvæ are called 'loopers.' The name has no great precision, but is applied to such of the moths as have beautifully-patterned wings, and have not received more distinctive names. Thus, *Cidaria sagittata* is the marsh carpet moth, a rare form occurring in the Fen country of England; and *Melanthia albicillata* is the beautiful carpet moth.

**Carpets** came to us originally from the East, where the rug or carpet is the most important—often, indeed, almost the only—furnishing of the house: the Moslem always spreads his carpet for prayer. Turkey, Persia, and India still send us the most beautiful examples of the art, though the perfect designs of old time are being vulgarized by the disastrous influence of the West. But it is with the modern industry, as carried on in European factories, that we have here to do.



France was the first to develop carpet-making (at the Louvre in 1607); but the revocation in 1685 of the Edict of Nantes drove many French craftsmen across the Channel, to settle at Bristol, Axminster, and other places in the south-west of England. At this date the carpet had not replaced the floor covering of strewn rushes in Britain. The industry soon spread to Glasgow, Kidderminster, and the Yorkshire towns (Dewsbury, etc.). It was started at Philadelphia, U.S.A., in 1791, and was greatly developed by Scotsmen in that and other cities; and since then America has played the most important part in the designing of carpet looms, though she has invented no new structure of carpet.

There are two distinct classes of carpets—viz. ordinary woven fabrics and pile fabrics.

*Ordinary Woven Fabrics.*—These are variously known as Scottish or 'Kidder' carpets. The earliest known example of this double-cloth structure dates from about the 16th century. The industry was introduced to Kidderminster from Bristol in 1755, though the first power-loom for the purpose was invented in Scotland in 1850. Kidder carpets have a flat surface, and are reversible; but the relation of colours on one side is opposite to that on the other, so that if there is a black design on a red ground on one side, there is a red design on a black ground on the other.

Of *Pile Fabrics* there are three principal kinds—viz. (1) Chenille Piles, known as Chenille Axminsters; (2) ordinary wired Piles, known as Tapestry, Brussels, Wilton, or Velvet carpets; and (3) Tuft-woven Piles, known as Victoria, Royal, etc., Axminsters.

*Chenille Axminsters.*—Chenille (Fr. 'caterpillar') denotes a thick, loose, fluffy thread. The figure on this carpet is of a coloured

pile formed by a series of woven pile-threads, or, as they are technically called, 'chenille-picks.' Each pick is of one of the colours of the design, and the weaving operation consists in laying these picks in their right relative positions in the cloth. The picks themselves are first woven in the required colours on a kind of gauze foundation, which holds the fluffy pile very firmly.

The *Brussels* is a wired-pile carpet. Its pile consists of loose loops of worsted thread formed over wires, and held down at their bases by a firm fabric of linen threads, into which the coloured worsted loops are woven. The Flemish origin of this carpet is shown by the width of the piece being still the Flemish ell; and the first Brussels carpet loom introduced into England came from Tournay in 1749. When the wires, after forming the loops, cut through them at their highest point, the *Wilton* or *Velvet* carpet is produced; the pile in this case forms a kind of plush. The *Tapestry* carpet is the simplest form of the wired-pile carpet, and resembles a Brussels carpet. The pattern is, however, not produced by the weaving together of threads of different colours, but is printed on the warp in an elongated form. The looping of the warp by the wires in the weaving process reduces the pattern to its proper proportions. The tapestry carpet usually has a wadded ground texture, to give the necessary elasticity. The warp is printed, thread by thread—a method which allows of a large number of colours, and consequently has been used for turning out many gaudy atrocities. The *Victoria*, *Royal*, *Aristo*, and other Axminster carpets of this type are tufted fabrics, in imitation of those Eastern styles in which the 'Oriental knot' is employed to make a very fast



pile; hence the term 'moquette,' often applied to them. James I. established a factory at Mortlake for the moquette variety. The power-loom which produces this tufted pile (without the knot) was invented in New York in 1856, and the British patent rights were acquired by a Kidderminster firm in 1875. In these carpets the design is arranged by rows of bobbins, each holding yarn of the colour answering to its position in the pattern; a small piece is inserted as a tuft in the jute foundation as the latter is woven, and is then cut by machinery. For Oriental carpets, see Martin's *History of Oriental Carpets before 1800* (1906-8), and the Vienna museum's book (Eng. ed. by C. P. Clarke), 1892-6.

**Carpi**, tn. and episc. see, prov. Modena, Italy, 9 m. N. by W. of Modena. It has two cathedrals and a fine Renaissance church of the 15th century, and carries on silk industries. Pop. (comm.) 23,000.

**Carpineto**, tn., prov. Rome, Italy, 47 m. S.E. of Rome (*viâ Segni*), was the birthplace of Pope Leo XIII. (1810-1903). Pop. 4,800.

**Carpino**, tn., Apulia, Italy, prov. of and 30 m. N.E. of Foggia. Pop. 6,500.

**Carpini**, GIOVANNI DE PIANO, a Franciscan traveller of the 13th century, born near Perugia. Dispatched by Innocent IV. in 1246 on a mission to the grand khan, Carpini crossed Bohemia, Silesia, Poland, and Russia; thence, by the Dnieper and the Black Sea, penetrated into Mongolia, meeting the khan near Karakorum. The narrative of his expedition gives the earliest account of the Mongols, and is in part embodied in Hakluyt (1599), and edited in full by D'Avezac in the 4th vol. of *Recueil de Voyages* (1838). On his return home Carpini was appointed bishop of Antivari in Dalmatia.

**Carpocrates**, an Alexandrian Jew, a Gnostic of the 2nd century, who taught the pre-existence of souls. Those who can recall their pre-existing state may regain the harmony of complete union with God. Jesus was one in whom this remembrance was especially perfect and complete. He therefore attained to exceptional spiritual power. Carpocrates and his son Epiphanes taught that this life of spiritual contemplation was independent of ordinary morality.

**Carpophore**, in botany, is a continuation of the flower-stalk, which passes in certain flowers, notably those of the order Umbelliferae, between the carpels, until it reaches their highest points. Often when the carpels are ripe, and separate from one another, they remain attached to the carpophore at its summit.

**Carpus** (Gr. 'wrist'), in anatomy, consists of those eight bones which lie between the forearm and the palm. When the hand hangs down with the palm forward, the bones lie in two irregular rows of four, one row below the other.

**Carr**, JOSEPH WILLIAM COMYNS (1849), English art critic, born in London; became a constant contributor to the *Academy*, *Saturday Review*, *Examiner*, and *Pall Mall Gazette*; also was appointed English editor of *L'Art* in 1875. He was one of the founders and a director of the Grosvenor Gallery, London. Among his works are *Drawings by the Old Masters* (1877), *Examples of Contemporary Art* (1878), *Essays on Art and Art in Provincial France* (1883). He also wrote *King Arthur*, produced at the Lyceum in 1895, and *In the Days of the Duke* (with Haddon Chambers) in 1897; *A Fireside Hamlet*, *A United Pair*, etc.

**Carr**, ROBERT. See SOMERSET, EARL OF.

**Carracci**, or CARACCI, the name of three Bolognese painters of the 16th century, founders of the



eclectic school. LUDOVICO (1555-1619), after studying under Tintoretto, founded a school upon the principles of art practised by the great masters. Having enlisted the co-operation of his cousins, AGOSTINO (1557-1600) and ANNIBALE (1560-1609), the school, opened in 1589, soon rose to prominence, such painters as Domenichino, Albano, and Guido Reni being among its pupils. The work of the Carracci is characterized by correct technique, large design, fine figure-drawing, but it lacks spontaneity and creative impulse. Their great merit is to have arrested the decline of Italian art for a period, to have encouraged the production of easel pictures, and to have liberated Italian landscape art from its dependence on figure subjects. Annibale was the most distinguished painter of the three. In 1600, accompanied by Agostino, he went to Rome to paint the Farnese frescoes, and there developed a powerful style influenced by Michael Angelo. Of Ludovico there are examples in London and Edinburgh National Galleries. Annibale's best work is his mythological frescoes in Rome, which have been frequently engraved. The National Gallery, London, has seven of his works, and Dublin a *Christ on the Cross*. Agostino afterwards settled in Parma, and is remembered for his *Communion of St. Jerome*, and *Love—Celestial, Terrestrial, and Venal*.

**Carrageen**, or IRISH MOSS, a seaweed (*Chondrus crispus*) common between tide-marks on European and American coasts. It is a short, tough, branching alga of a reddish or purple brown colour; it is collected, washed in fresh water, and bleached in the sun. From the dried weed a jelly is made by boiling in water or milk, and this has a considerable reputation as a food for invalids. Carrageen is also used for feeding

cattle, and in the preparation of size.

**Carranza**, BARTOLOMÆUS DE (1503-76), born at Miranda in Navarre; entered the Dominican order; was professor of theology at Valladolid; sat in the Council of Trent (1546 and 1551). Coming to England with Philip II., he was chosen as Queen Mary's confessor, and worked zealously for Catholicism. Becoming archbishop of Toledo (1557), he was accused of heresy by the Inquisition because of his book, *Comentarios sobre el Catechismo Cristiano* (1558), and passed the remainder of his life in prison. See *Life*, in German, by Laugwitz (1870).

**Carrara**, tn., prov. Massa Carrara, Italy, 18 m. by rail E. by S. of Spezia; lies in a valley of the Apuan Alps, and is famous for its quarries of fine-grained marble, mostly white, but also black, yellow, and green. There are hundreds of quarries in the neighbourhood, giving employment to over 10,000 men, and over £200,000 worth of marble is exported annually from the port of Avenza, 3 m. distant. There are an academy of fine art, a school of sculpture, and many artists' ateliers in the town. The Carraran marble was known to the Romans, who called it *marmor lunense* (from the port of Luna). Between the downfall of the empire and the end of the 15th century it was not worked; it is now, however, in great request. Pop., including Avenza, 42,000.

**Carrel**, NICOLAS ARMAND (1800-36), French publicist, born at Rouen. After a short military career he became Thierry's secretary and collaborator. In 1830 he joined Thiers and Mignet in editing the *National*. When, after the Revolution, his colleagues entered the government, and Carrel was left editor-in-chief, his bold and spirited attacks on the monarchy enhanced the *National's*



popularity, which government prosecutions and fines only stimulated. A newspaper war with the editor of *La Presse* led to a duel, in which Carrel was mortally wounded. His *Œuvres Politiques et Littéraires* were edited by Littré (5 vols. 1854-8).

**Carrer, LUIGI** (1801-50), Italian poet and scholar, born at Venice; held professorships of philosophy at Padua (1830) and at Venice (1844), and was subsequently appointed custodian of the Museo Carrer in that city, a post which he held till his death. He published several volumes of poetry, his lyrical pieces showing the influence of Foscolo (whose *Life* he wrote); and introduced the ballad from Germany with much success, his *L'Anello di Sette Gemme* (1838), which relates the picturesque story of Venice and her customs, being still popular. As an editor of various Italian classics—Petrarch, Boiardo, Della Casa, Bembo, Michael Angelo, Foscolo, Goldoni, etc.—Carrer did valuable work. From 1836 to 1838 he superintended the publication of *Il Novellista Contemporaneo Italiano e Straniero*. See *Life* by Venanzio in the *Opere di Luigi Carrer*, Florence (1855); Crespan's *Della Vita e delle Lettere di Luigi Carrer* (1869); Sartorio's *Luigi Carrer* (1900).

**Carrhæ**, called Haran in the Bible, a city of Osroene, in Mesopotamia, where Crassus died, after having been decisively defeated by the Parthians, in 53 B.C.

**Carriacou**, largest of the Grenadine Is., British West Indies, in 12° 30' N. lat. Cotton is produced. Area, 11 sq. m. Pop. 7,700.

**Carriage.** The name applies indiscriminately to all vehicular methods of progression for the transportation of goods, and more particularly of human beings. The history of the car-

riage goes back to a far antiquity, the chariot being well known to the Egyptians, the Israelites, and the ancient Greeks and Romans. The car or chariot of the ancient Britons was used chiefly for purposes of war. The comparatively modern covered carriage dates from the 15th century. The varieties of carriage in common use are manifold, and include the ordinary hackney coach, first introduced into London in 1625, which superseded the sedan chair, and in its turn was supplanted in 1820 by the vehicle now known as a cab. The hansom cab, invented by J. A. Hansom, was introduced as a hackney carriage in 1834 in London. These modes of progression have, however, steadily waned under the widespread influence of the motor taxi-cab. The Victorian era was pre-eminently the era of the private carriage, in which the brougham, invented in 1839 by Lord Brougham, landau, victoria, and four-in-hand were the most conspicuous of the four-wheeled variety. Of the two-wheeled carriage, the most familiar forms include the 'stanhope,' 'tilbury,' gig, and the dog-cart. See COACHING.

**Carriage-building.** The body of a carriage is first drawn to full size in elevation, usually on a canvas stretched along the side of the workshop; from this the 'cant boards' are prepared, showing the curves of the body as presented in end elevation and plan; and finally a complete series of working drawings are made for the guidance of the 'body-makers,' showing all details and dimensions for whatever style of carriage it is proposed to build. Similarly, the 'carriage-makers,' or those who construct the under frame of the vehicle, have details worked out for them from one general design—a course which ensures the harmony of the whole structure.



*Materials.*—A plentiful supply of well-seasoned timber is necessary for carriage-building—ash for the framework, mahogany for panels, white pine for roof, oak for the spokes of wheels and elm for their hubs, lancewood for shafts, and walnut for the varnished bodies of dog-carts. The wood is stored in a warm, dry place, and care is taken to avoid warping. Springs are made from the best steel, specially prepared for the purpose; axles from wrought iron, carefully 'fagoted'—*i.e.* they are composed of a number of thin rods twisted and welded together into one bar. The skins for leather coverings to the seats and sides of carriages must be so selected as to present a uniform colour and 'shine,' and to be of an even texture throughout, so that each piece may stretch to an equal extent. A better result is obtained by the use of slightly inferior leather of a uniform quality than from leather of a superior but uneven texture and gloss.

*Method of Construction.*—In the manufacture of a carriage there are seven distinct branches, besides such subsidiary trades as supply the axles and springs, lamps, paint and varnish. (1.) Body-makers concern themselves only with the body, the most conspicuous and costly part of the vehicle. (2.) Carriage-makers construct and erect the under-frames, springs, and shafts. (3.) Wheelers make the wheels. (4.) Smiths shape the iron joint-plates, and (5) vicemen fix and adjust them. (6.) Painters are responsible for the decoration of the outside of the carriage, and (7) trimmers for its inner appointments.

Wheels are now made almost entirely by machinery, the only hand operations being the shrinking on of the red-hot iron tyre, and the fitting of bushes or 'boxes' to the extremities of the axles. The spokes are mechanically shaped

and polished, and fitted radially into the machine-turned hub.

The painting of a carriage is the most tedious operation in its manufacture, and one which it is impossible to hasten, as each coat must be thoroughly dry before the application of the next.

*Trimming* consists in the upholstery of the seats and the interiors. In this a harmonious arrangement of colours and design is essential to the appearance of the finished carriage.

**Carriage Dog.** See DALMATIAN DOG.

**Carriage Licences.** The following are the carriage licences for the United Kingdom:—Carriage (annual), four wheels, for two or more horses, £2, 2s.; carriage (annual), four wheels, for one horse, £1, 1s.; carriage (annual), less than four wheels, 15s.; carriage (annual), hackney carriage, 15s. Half-rate only is charged if the licence is taken out between October 1 and December 31. Armorial bearings, used on carriage, £2, 2s. Motor carriages under 6½ horse power, £2, 2s.; over 6½ horse power, there is a graduated scale, those of 60 horse power or over paying £42.

**Carrick.** The southernmost division of Ayrshire, Scotland, from which the Prince of Wales derives his title of Earl of Carrick.

**Carrick, THOMAS** (1802-75), English miniature painter, born at Upperley, near Carlisle, Cumberland, was a self-taught artist. Becoming a chemist, he neglected his business for miniature painting, and was obliged to remove first to Newcastle (1836), then to London (1839). Among others, he painted miniatures of Wordsworth, Sir R. Peel, Rogers, Longfellow, and Carlyle.

**Carrickfergus**, mrkt. tn. and port, co. Antrim, Ireland, 10 m. N.N.E. of Belfast, on Belfast Lough. Formerly surrounded by



walls, portions of which are still standing, it is famous as the landing-place of William of Orange in 1690. The castle (12th century) is fortified, and occupied as an arsenal. It manufactures linen and cotton, mines salt, and cultivates oysters. Pop. 4,200.

**Carrickmacross**, par. and mrkt. tn., in co. of and 25 m. s.s.e. of Monaghan. Lace making is an important industry. Pop. 5,300.

**Carrick-on-Shannon**, mrkt. tn., cap. of Leitrim, Ireland, on riv. Shannon, 37 m. s.e. of Sligo. Its trade is largely in dairy produce. Pop. 1,400.

**Carrick-on-Suir**, mrkt. tn. in S.E. Tipperary, Ireland, on l. bk. of riv. Suir, 12 m. E. of Clonmel. An old stone bridge connects it with Carrickbeg (Co. Waterford). There is trade in slate and coal. Pop. 5,500.

**Carrick Pursuivant**. See HERALD.

**Carrier**. In law, a common carrier is a person holding himself out as ready and willing to carry for hire the goods of any one choosing to employ him; he is bound to carry, for a reasonable reward, all goods offered to him (except specially dangerous articles) to the place to which he professes to carry goods, provided his conveyance will hold them, and the hire is prepaid, if demanded. If he accepts goods for carriage, he has a lien on them for his charges if these have not been paid. He is an insurer of the goods entrusted to him—*i.e.* he is responsible (unless he limited his liability by a special contract) for loss or damage to them, if not occasioned by the act of God, the king's enemies, or the inherent vice of the article carried; but by the Carriers Act, 1830, in respect of various articles of value therein mentioned, a common carrier by land is exempt from liability, except for

the felonious acts of his servants, if any package containing them exceeds £10 in value, unless the value and nature of the package are declared when delivered to him, and, if demanded, an increased rate of carriage paid. Notice of the higher rates demandable must be affixed in legible characters in some conspicuous part of the office or receiving house; failure to comply with this requirement, or failure to give a receipt if requested by the sender, deprives a carrier of the benefits of the act. A special contract may still be entered into for the carriage of goods; but a carrier cannot protect himself from liability as to goods not mentioned in the Carriers Act merely by publishing a notice that he will not be liable. A contract exempting a railway or canal company from liability in respect of goods or animals arising from its own negligence or default, must be signed by the consignor, and must be reasonable. A carrier is only liable for the goods of which he is the 'common carrier.' A railway is not a common carrier of passengers, and thus, in the event of accidents, is only liable if negligence can be proved. A common carrier is bound to deliver the goods within a reasonable time; and if the goods are to be sent for by the receiver, they must be sent for within a reasonable time. By the Railway and Canal Traffic Act, 1854, the liability of railways and canals as to animals is limited. Railway and canal companies may be ordered by the Railway and Canal Commissioners appointed under the Railway and Canal Traffic Act, 1888, to afford reasonable facilities, and the commissioners may hear and determine complaints as to the increases of rates. Maximum rates are fixed for each company by provisional order of the Board of Trade.



The liability of a shipowner is the same as that of a common carrier at common law, save in so far as it is limited by the Merchant Shipping Act 1894, and by the contract of affreightment. See Macnamara's *Law of Carriers* (1908), and under FREIGHT.

**Carrier, JEAN BAPTISTE** (1756-94), French politician, born at Yolet (Cantal), was a member of the National Convention (1792), and was sent to Nantes (1793), where for three months 'arbitrary imprisonments, fusillades, *noyades*, and debaucheries formed Carrier's usual pastime.' Shocked at his outrages, Robespierre recalled him, and on the fall of Robespierre he was guillotined.

**Carrière, EUGÈNE ANATOLE** (1849-1906), French painter, born at Gournay (Seine-Inférieure); he was a great painter of maternity—not of the Madonna, but of the mother absorbed in the care of her children. He worked at Vaugirard through many years of non-recognition. A consummate draughtsman, he painted as a sculptor works; and in order to emphasize the inner life, he isolated the figure by enveloping it in a soft haze. His famous *Maternity* (1892) is in the Luxembourg at Paris, *The Young Mother* (1878) at Avignon, and *The Sick Child* (1886) at Montargis. Among other remarkable pictures are *Théâtre de Belleville* (where he discloses the mind of the audience); his portraits of Daudet, De Goncourt, Verlaine, Anatole France, Reclus, Henri Rochefort, and Metchnikov; *Christ on the Cross* (1897); and a decorative panel at the Sorbonne (1898). See the *Studio*, 1896.

**Carrière, MORITZ** (1817-95), German philosopher, born at Griedel, near Butzbach, in Hesse-Darmstadt; was appointed, in 1853, professor of æsthetics at Munich. His philosophy is an

attempt to reconcile deism and pantheism, and maintains the ultimate triumph of the beautiful and the good. His works embrace *Asthetik* (3rd ed. 1884); *Die Kunst . . . und die Ideale der Menschheit* (3rd ed. 1876-86); *Jesus Christus und die Wissenschaft der Gegenwart* (2nd ed. 1889); *Die Poesie, ihr Wesen und ihre Formen* (2nd ed. 1884); *Die Sittliche Weltordnung* (2nd ed. 1891); *Die philosophische Weltanschauung der Reformationszeit* (2nd ed. 1887). His *Gesammelte Werke* appeared in 14 vols. (1886-94).

**Carrier Pigeon.** See PIGEON.

**Carrington**, suburb of Newcastle, New South Wales (1 m. w., on a small island), with one of the largest foundries and engineering works in Australia. Coal mines in the vicinity. Pop. 2,600.

**Carrington, CHARLES ROBERT WYNN-CARRINGTON, FIRST EARL OF** (1843), joint hereditary lord great chamberlain, was made an earl in 1895. He represented Wycombe in the House of Commons (1865-8), and from 1885-90 was governor of New South Wales. From 1892-5 he was lord chamberlain. He is chairman of the National Liberal Club, and an active member of the London County Council. In 1901 he was selected as an ambassador to announce the accession of King Edward to foreign sovereigns. In Sir H. Campbell-Bannerman's administration (1905) he was appointed president of the Board of Agriculture. Lord Carrington has keenly interested himself in providing allotments and small holdings in agricultural districts.

**Carrington, SIR FREDERICK** (1844), an English soldier, born at Cheltenham, commanded light horse ('Carrington's Horse') in S. Africa in 1877, and fought against the Kaffirs (1877-9), Basutos (1881), and in Bechuanaland (1884-5). In 1896 he commanded the forces engaged in the suppression of



the rebellion in Matabeleland and Mashonaland. Soon after the outbreak of the South African war (1899-1902) he proceeded to the front in command of the Rhodesian Field Force, with which he landed at Beira, and, joining hands with Colonel Mahon, helped to raise the siege of Mafeking (May 17-18, 1900). He was created K.C.B. (1897).

**Carrington, HENRY BEEBEE** (1824), American soldier and author, born at Wallingford, Connecticut. He successfully quelled several risings among the Indians. He has written *Russia as a Nation* (1849), *American Classics, Battles of the [American] Revolution* (1876), *The Six Nations* (1892), *Washington the Soldier* (1898), *Lafayette and American Independence*, etc.

**Carrington, RICHARD CHRISTOPHER** (1826-75), English astronomer, born at Chelsea; equipped an observatory at Redhill, Surrey, in 1853, and completed in 1857 a *Catalogue of 3,735 Circumpolar Stars*. His observations of sun spots, and discovery of the composite law of solar rotation, were published in 1863.

**Carrion Crow** (*Corvus corone*), a close ally of the hooded crow (*Corvus cornix*), with which it is stated to interbreed. It differs from the latter in the uniform shimmering black plumage. In the United States the name carrion crow is given to a black vulture (*Catharista atrata*), which performs scavenging work in the towns along the Gulf of Mexico and northwards to Charleston in S. Carolina.

**Carrion Flowers**, or STAPELIAS, are members of a genus of S. African succulent plants belonging to the order Asclepiadeæ. They derive their popular name from the odour of their flowers, which are usually showy and frequently beautiful. The plants are leafless, and the stems are

quadrangular, with teeth projecting from each edge. They are grown in a mixture of light loam, sand, and broken brick in equal proportions, and are easily propagated by means of cuttings. They are sometimes spoken of as the African toad-flowers. In the United States the name is given to a species of *Smilax*.

**Carroccio**, a large chariot or van on which, in the middle ages, the banner of an Italian town was carried into battle. It was painted red, and had in the middle a red pole with a golden apple at the top, into which the flag was fixed. This was regarded as the palladium of the city. The originator of the practice is reputed to have been Aribert, archbishop of Milan, when his city was being besieged in 1038 by order of the Emperor Conrad II. The carroccio of Milan was lost in the battle of Corte Nuova (1237) against the Emperor Frederick II. The battle of the Standard, near Northallerton in England (1138), owed its name to a standard planted by the Scots on a carroccio or wagon, after the Italian fashion.

**Carrodus, JOHN TIPLADY** (1836-95), English violinist, born at Braithwaite (Yorks); studied at Stuttgart. After playing in the orchestra at Covent Garden, he ultimately became principal violinist in the Philharmonic and other leading orchestras of London. For many years he occupied an honoured position as a soloist and quartet player. His publications include a fantasia, a romance, and a collection of violin duets edited by himself.

**Carroll, CHARLES**, of Carrollton (1737-1832), American patriot, was the last surviving signer of the Declaration of Independence. As 'first citizen' (*Maryland Gazette*, 1773) he opposed Dulany on arbitrary taxation. He was, in 1776, sent, with Franklin and Chase, to



incite Canada to revolt. See *Life* by Rowland (1898).

**Carroll, LEWIS** — pseudonym of CHARLES LUTWIDGE DODGSON (1832-98) — English mathematician and writer of fairy tales, born at Daresbury, Cheshire; educated at Christ Church, Oxford, of which he became a mathematical lecturer (1855-81). His Oxford life was almost that of a recluse, but he delighted in the society of little girls. In the affairs of the university he interested himself to the extent of an occasional witty pamphlet. Six of these were published between 1865 and 1874, and are collectively known as *Notes by an Oxford Chiel*. His mathematical speculations were ingenious rather than profound. He delighted in the invention of games and puzzles. He published *Alice's Adventures in Wonderland* in 1865. The verbal felicities and whimsical logic of this, aided by Tenniel's clever drawings, proved attractive both to children and to their elders. It was followed by *Through the Looking-glass, and what Alice found there* (1871), and by some other attempts of less account. Lewis Carroll was also responsible for a good deal of humorous verse, of which *The Hunting of the Snark* (1876) is the best. Other works: *Curiosa Mathematica* (1883-93), *Principles of Parliamentary Representation* (1884), *Symbolic Logic* (1896), *Sylvie and Bruno* (1889), *Sylvie and Bruno Concluded* (1893). See S. D. Collingwood's *The Life and Letters of Lewis Carroll* (1898); Isa Bowman's *The Story of Lewis Carroll* (1899).

**Carrollton**, suburb of New Orleans, U.S.A.

**Carron**, vil., Stirlingshire, Scotland, on riv. Carron, 1 m. N.W. of Falkirk; noted for its extensive iron works, founded by Dr. Roebuck of Sheffield in 1760. At one time it was famous for the

manufacture of cannon and shot, hence the name 'carronades.' Ranges, grates, stoves, stable fittings, and general castings are manufactured. Pop. 2,000.

**Carronade** (from Carron—see above—where the weapon was first made), originally called 'smasher,' a short piece of ordnance in use in the British navy in the latter days of wooden ships. It was adopted in the service in June 1779. Carronades were made in several sizes, varying from the 12-pounder of 2 ft. 2 in. long to the 32-pounder of 4 ft. 0½ in. long. Large carronades, 68-pounders, were ultimately adopted, and were 5 ft. 2 in. long, and weighed 36 cwt., with a calibre of 7.702 in.

**Carron Oil**, a mixture of equal parts of lime-water and linseed oil, is used as an application for burns, and takes its name from the Carron Iron Works, where it was formerly much in favour among the workmen.

**Carrot.** The garden carrot derives its origin from the wild species *Daucus Carota*. It is a member of the order Umbelliferae. In order to grow well, carrots should be provided with a light, moderately rich, deeply cultivated soil. Manure should not be added at or immediately before the time of sowing, but a heavy dressing should have been applied for the previous crop. The first sowing of a variety like 'Sutton's gem' may be made in a sheltered, sunny place at the end of February. The seeds should be sown in drills nine inches apart, the carrots being afterwards thinned out so that four inches are allowed to each root in the row. The main crop should be sown at the end of April, eighteen inches being allowed between the drills and six inches between the plants in the row. A later sowing for early spring use may be made early in July, selecting a variety like 'early



Nantes,' and allowing the same distances as at the first sowing. If wire-worms are found to be troublesome, apply gas lime in winter, or grow a crop of mustard and dig it into the soil. In some parts of Britain the red outer layer is grated down and used as a colouring for butter.

**Carruthers, ROBERT** (1799-1878), Scottish journalist, born at Dumfries. In 1828 he became editor of the *Inverness Courier*, and conducted it until his death. Carruthers's publications include *Hist. of Huntingdon* (1824); *Poetry of Milton's Prose* (1827); *The Highland Notebook, or Sketches and Anecdotes* (1843); *Boswell's Tour to the Hebrides, with notes* (1851); editions of Pope's poems (1853 and 1858); *The Life of Alexander Pope, with Extracts from his Correspondence* (1857). He collaborated with Robert Chambers on his *Cyclopædia of Eng. Lit.* (1843-4) and with William Chambers on his *Bowdlerized Household Edition of Shakespeare* (1861-3), supplied the 'Abbotsford Notanda' to R. Chambers's *Life of Scott* (3rd ed. 1871), to the eighth edition of the *Encyc. Brit.* contributed several biographies, and furnished memoirs of Falconer (1858), James Montgomery (1860), and Gray (1876) for editions of their poems. See *Memoir of William and Robert Chambers* (13th ed. 1884); *Memoir* prefixed to Thomas Aird's *Poetical Works*, edited by Rev. Jardine Wallace (1878).

**Carrying over.** See STOCK EXCHANGE.

**Carse of Gowrie**, rich arable dist. of Perthshire and Forfarshire, Scotland, N. bank of the Tay, extending for some 15 m. E. from Perth.

**Carshalton**, par. and vil., Surrey, England, 3 m. S.W. of Croydon; has ironworks and paper and flour mills. Pop. 6,800.

**Carsoli**, comm., Abruzzi, Italy, prov. of and 25 m. S.W. of Aquila. Pop. 6,600.

**Carson, CHRISTOPHER** (1809-68), American hunter, scout, and frontiersman, generally known as Kit Carson, born in Kentucky, became a trapper at the age of seventeen. He acted as guide to Frémont in his exploration in the Rocky Mts. (1842-4), served under him during the conquest of California (1846-7), and, settling in New Mexico in 1854, became United States Indian agent at Taos, and was breveted brigadier-general for services rendered there during the Civil War. He died at Fort Lynn, Colorado. See *Lives* by Burdette (1869) and Peters (1874).

**Carson, SIR EDWARD HENRY** (1854), British lawyer and politician, born at Dublin. Lord Salisbury appointed him solicitor-general for Ireland (1886-92), without a seat in Parliament. This he obtained at the general election of 1892, when he was returned for Dublin University; and has represented that constituency ever since. During the Home Rule Parliament (1892-5) he was one of the most strenuous opponents of Mr. Gladstone's Irish policy. He led the open revolt of the Irish landlord party in the House of Commons against Mr. Gerald Balfour's Land Bill of 1896. In spite of this he was, in July 1900, appointed solicitor-general for England and knighted. Sir Edward Carson, who was called to the Irish bar in 1877 (silk, 1889), and to the English bar in 1893 (silk, 1894), has won a high reputation for brilliant cross-examination. He is strongly in favour of a Catholic university for Ireland. He is easily the chief figure among the Irish Unionist members, and is an untiring opponent of Home Rule.

**Carson City**, cap. of Ormsby co., and of the State of Nevada,



U.S.A., 175 m. N.E. of San Francisco; has a U.S. mint and railway workshops. Gold and silver are mined. Hot springs are in the vicinity. Pop. 2,200.

**Carstairs**, par. and vil. in E. Lanarkshire, Scotland, on river Clyde, 3 m. E.N.E. of Lanark and 1 m. W.N.W. of Carstairs Junction, on C.R., where the main line from the south forks for Glasgow and Edinburgh. Pop. 2,000.

**Carstares**, WILLIAM (1649-1715), Scottish statesman and divine, born at Glasgow; studied at Utrecht. In 1674 he was arrested for treason and was thrown into Edinburgh Castle, where he lay untried till he was released in 1679. From this time onward he was one of the principal agents in bringing about the advent of the Prince of Orange. He took a leading part in the organization of the proposed rising in which Shaftesbury, Russell, and Argyll were the chief actors, but did not approve of the Rye House plot, on the discovery of which he was captured at Tenterden, Kent (1683), and once more sent to the Tolbooth, Edinburgh. Returning to Holland, he was appointed second minister of the Scottish congregation at Leyden and chaplain to William. He accompanied the Prince of Orange to Torbay, and William thenceforward relied implicitly on Carstares so far as the government of Scotland was concerned. The Scottish revolution settlement owed its form in great part to him. That the establishment of the church was Presbyterian was chiefly his work; on the other hand, patronage was abolished against his advice. In 1703 he was appointed principal of Edinburgh University; he was also minister of the Greyfriars' Church in that city. He was four times (in 1705, 1708, 1711, and 1715) moderator of the General Assembly. Carstares was an active promoter of the union.

He headed a deputation from the General Assembly to London in 1711, which made a brave effort to modify the form of the abjuration oath, and to prevent the passage of the new Patronage Act. He was largely influential in limiting the consequent secession from the Church of Scotland. See R. H. Story's *Life of Carstares* (1874); *The Carstares State Papers*; Æ. J. G. Mackay, in the *Dict. of Nat. Biog.*; and A. Lang's *Hist. of Scotland* (1907).

**Carstens**, ASMUS JACOB (1754-98), Danish painter, born near Schleswig; the initiator of the classical reaction in Germany. Influenced by Winckelmann, he conceived an admiration for Hellenic ideals, and rebelled against the rococo school and academic traditions. His ideas were met by violent opposition, and, hampered by poverty, he supported himself by portraiture, until, in 1787, he obtained a professorship at the Academy, Berlin. This enabled him to go to Rome, where he studied Michael Angelo and Raphael. In his pictures, almost all classical in subject, he laid stress on beauty of line, practically to the disregard of colour. The ducal collection at Weimar is rich in them, and there are many also at Copenhagen and Berlin. His *Argonaut* cycle has been engraved in twenty-four plates.

**Cartagena**. (1.) City, prov. Murcia, Spain, near S.E. corner of the country; principal Spanish naval arsenal and dockyard; fortress of first class. It is also an episcopal see. Founded in 223 B.C. by the Carthaginian Hasdrubal as Carthago Nova, it was taken by Scipio in 209 B.C. In 1873-4 it was the scene of a famous siege during the civil war. Principal industry, apart from shipping and fruit-growing, is the working of silver-lead mines in neighbourhood. The annual value of the exports is about £1,400,000, and



imports over £6,000,000, besides which there is a coasting trade of about two millions sterling. Pop. 100,000. (2.) Town, Colombia, on the finest harbour in the republic, 420 m. N. by W. of Bogotá. Since the opening of the harbour at Sabanilla, however, it has lost its importance. Cane-sugar, shoes, soap, candles, and hosiery are the principal products. Coffee, tobacco, hides, and rubber are exported. The total trade is valued at about £1,000,000 per annum. Among the buildings are a university, library, school of music, and art school. Pop. 25,000.

**BATTLE OF CARTAGENA.** In April 1708 Rear-admiral Charles Wager put to sea from Jamaica, in order to intercept certain Spanish galleons which were about to sail from Puerto Bello to Havana. Wager sighted the quarry off Cartagena. Two of Wager's captains behaved badly, and were afterwards convicted of neglect of duty; yet one of the Spanish vessels was blown up, and another was taken.

**Cartago.** (1.) Town, Colombia, on the Viejo, 140 m. W. of Bogotá. It produces cocoa, coffee, tobacco, and cattle. Alt. 3,210 ft. Pop. about 10,000. (2.) Town, cap. of prov. of same name, Costa Rica, 12 m. S.E. of San José. It lies dangerously near the base of the active volcano of Irazu or Cartago (11,200 ft.), and has been partially destroyed by earthquakes several times, the latest being in May 1910. Produces coffee, tropical fruits, bananas, etc. Pop. 5,000.

**Carte, RICHARD D'OYLY** (1845-1901), British theatrical manager, notable for his intimate connection with Sir A. Sullivan, turned his attention to comic opera in 1870, and in 1877 made his fame by the production of *The Sorcerer* at the Opéra Comique, London. With the profits from this and other Sullivan operas he built the Savoy Theatre. Here were

produced *The Mikado* (1885), *The Gondoliers* (1889), *The Rose of Persia* (1899), as well as works by Solomon, Messenger, and Mackenzie. The attempt to establish a Grand English Opera House (now the Palace Theatre) proved disastrous. He also wrote songs and operettas.

**Carte, THOMAS** (1686-1754), English historian, born at Clifton-upon-Dunsmore, Warwickshire. A Jacobite, he refused to take the oaths to George I. Escaping to France in 1722 on £1,000 being offered for his apprehension for complicity in the Atterbury conspiracy, he remained there until 1728, assuming the name of Phillips. He was the author of *Life of James, Duke of Ormonde* (2 vols. 1736), and *Hist. of Eng. to 1654* (4 vols. 1747-55).

**Cartel.** (1.) A ship commissioned in time of war to exchange the prisoners of any two hostile powers, or to carry proposals from one to another. No arms, ammunition, or warlike materials are carried on board, with the exception of a single gun for making signals. (2.) In Germany it means any friendly agreement between public bodies or institutions; it has been applied to associations of manufacturers or 'combines' agreeing among themselves to limit output, to maintain prices, or in other ways to regulate trade. A notable instance is the cartel or combine of German and Austrian sugar producers. (3.) Generally it is the term applied to a formal challenge to fight a duel.

**Carter, ELIZABETH** (1717-1806), English poetess and Greek scholar, born at Deal. She became a linguist, studying Portuguese and Arabic, and translated Epictetus (1758). She also published *Poems on Several Occasions* (1762). See *Life* by Pennington (2nd ed. 1808), and Alice Gausen's *A Woman of Wit and Wisdom* (1906).



**Carter, ROBERT BRUDENELL** (1828), English ophthalmic surgeon, born at Little Wittenham, Berks; was a staff-surgeon during the Crimean war, after which he became ophthalmic surgeon to St. George's Hospital, London, in 1870, and consulting surgeon in 1893. His chief works are *Hysteria* (1853), *A Practical Treatise on Diseases of the Eye* (1875), *Lectures on Cataract* (1884), *Doctors and their Work* (1903). He translated *Zander on the Ophthalmoscope* (1864), and Scheffler's *Optical Defects and Spectacles* (1869).

**Carteret, JOHN, EARL GRANVILLE** (1690-1763), English statesman, son of George, Lord Carteret. Becoming secretary of state (1721), he tried to contest the supremacy of the Walpole and Townshend section of the cabinet, but the struggle led to his defeat and resignation (1724). Appointed lord-lieutenant of Ireland, an office which he held for six years (1724-30) during the disturbances arising out of 'Wood's halfpence,' he obtained the recall of the obnoxious patent. He led the opposition to Walpole in the House of Lords (1730), and on Walpole's resignation became once more secretary of state (1742). But failure abroad and unpopularity at home led to his downfall in 1744, though the king created him Earl Granville on his dismissal from office. Two years later he and Lord Bath formed a ministry which lasted, as the wits said, 48 hours, 7 minutes, and 11 seconds. In political knowledge, oratory, and scholarship his brilliant talents astonished his contemporaries, but his reckless impracticability was fatal to successful statesmanship.

**Carteret, PHILIP** (d. 1796), English rear-admiral and geographical discoverer, who on an expedition to the south seas discovered Pitcairn I. (1767), also the islands of Sandwich, Byron, New Hanover.

His 'Journal' was published in Hawkesworth's *Voyages* (1773).

**Cartesius and Cartesian.** See DESCARTES.

**Carthage.** (1.) **KARTHADA** (Lat. *Carthago*; Gr. *Karchedon*) was the greatest town ever inhabited by the Phœnician race. It was founded about 850 B.C. (according to legend, by Dido), on a promontory at the north-eastern extremity of the Bay of Tunis, a few miles to the E. of the present city of Tunis. The new foundation (Carthage means 'new city') soon grew in prosperity, and outstripped Utica, the earliest Phœnician colony in Africa. The original city was situated on a hill called Bosra, or Byrsa, afterwards the citadel. There were two harbours—the inner, Cothon, for ships of war, and a larger outer one for merchant vessels. At the time of its destruction (146 B.C.) the population of Carthage amounted to 700,000. The constitution was oligarchic: there were two kings, elected annually, whose power was chiefly judicial; a council of 28 members, also elected annually, who chose the general, and were in theory the chief governing body; and another board of 104 judges, who became the really controlling power in the state, and were also elected annually, but appear to have been continually re-elected, so that the office was in practice held for life. The general assembly of the people had little power. Originally Carthage was little more than a trading station, but about 450 B.C. it subdued many Libyans. Its supremacy was also asserted over the inhabitants of the other Phœnician towns in Africa, such as Hippo, Hadrumetum, Little and Great Leptis, and Thapsus; only Utica remained independent. The N. African coast westward as far as the Atlantic was included in its dominion; and at the height of



its power, in the 3rd century B.C., it held also the western half of Sicily, Sardinia, the Balearic Isles, and most of Spain. In Sicily, in particular, the Phœnician settlements were very ancient, and had always been closely connected with Carthage. Thus, at its greatest extent, the empire of Carthage nearly surrounded the whole of the W. Mediterranean. The history consists chiefly in the wars with the Greeks and with the Romans. In Sicily the Carthaginians received a crushing defeat from the Greeks under Gelon, at Himera, in 480 B.C., and until nearly the end of that century were confined to the western end of the island. In 406-5 they captured Gela, Himera, Agrigentum, and other cities; and then held the western half of Sicily, until Timoleon's victory at the Crimissus in 339 B.C. again reduced them to their ancient limits. But after a time they recovered their former position, and maintained it until the outbreak of their struggle with Rome. In the first Punic war (264-241 B.C.)—*Punicus* being the Latin word for 'Phœnician'—Carthage lost Sicily, and soon afterwards Sardinia. Hamilcar was the hero of the war on the side of Carthage. To make up for the losses suffered, he, with his son-in-law and successor Hasdrubal and Hamilcar's son Hannibal, developed the Carthaginian power (236-221 B.C.) in Spain. In 218 B.C. Hannibal began the second Punic war, invaded Italy, and won several great battles (Trebias, Trasimenus, Cannæ); but he failed to disintegrate the confederacy of Rome, and leaving Italy in 203, was defeated at Zama by Scipio in 202. By this defeat Carthage lost Spain, and indeed all her possessions outside her own immediate territory, and became the vassal state of Rome. Yet the Romans declared war again in 149 B.C. (the third Punic war)

on very inadequate pretexts, and after a prolonged siege Carthage was taken and utterly destroyed by Scipio Æmilianus in 146 B.C., and her territory became the Roman province of Africa. In her struggle with Rome, Carthage had the advantage of wealth (she was the wealthiest city of antiquity) and of generals; but her mercenary troops—a motley horde of Phœnicians, Libyans, Numidians, Spaniards, Ligurians, and Gauls—were inferior to the homogeneous Italian army of Rome. The Phœnician population of Carthage was closely akin to the Hebrews, as is shown by such names as Hannibal, 'servant of Baal,' as Hananiah means 'servant of Jah.' In later times a Roman colony was founded at Carthage by Julius Cæsar, and developed by Augustus; it became once more the chief city of Roman Africa, and was the seat of several ecclesiastical (Christian) synods and councils. The Vandals captured it in 439 A.D., and held it until Belisarius took it and destroyed their power in 533. The Arabian conquerors finally destroyed the city in 698 A.D. The few ruins that exist belong to the Roman period. Compare PHœNICIA. See E. A. Freeman's *Sicily: Phœnician, Greek, and Roman* (1885); A. J. Church's *Carthage* (1886), Story of the Nations Series; N. Davis's *Carthage and her Remains* (1861); Boissier's *Afrique Romaine* (1901); Mabel Moore's *Carthage of the Phœnicians* (1905); and Flaubert's novel, *Salammbô* (1862). (2.) City, Missouri, U.S.A., the co. seat of Jasper co., in a lead and zinc region, about 140 m. s. of Kansas city. The manufactures include furniture, ploughs, flour, canned goods, and textiles. Here is Carthage College. The town was destroyed in the civil war, and entirely rebuilt from 1866 onwards. Pop. 10,000.

**Carthage**. See CARTAGENA.



**Carthago Nova.** See CARTAGENA.

**Carthamin** ( $C_{14}H_{16}O_7$ ), colouring matter extracted from the safflower (*Carthamus tinctorius*) by means of alkaline solutions. It is a red powder, soluble in alkaline solutions, and precipitated by acids; it is also soluble in alcohol, with a rich purple colour. Carthamin is used as a component of the cosmetic rouge.

**Carthusians, ORDER OF**, a religious brotherhood founded in 1086 by St. Bruno (died 1101). With six adherents, he built his little chapel at Chartreuse, in the Alps of Dauphiné, near Voiron. Here was developed the great parent monastery of La Grande Chartreuse, whence also was derived the general name of the order. Asceticism, fasting, prayer, reading, and manual labour, combined with an almost absolute retirement, and an abstention from speech except when at church or during their weekly walk—these are the characteristics of the brotherhood. There were also Carthusian nuns from about 1230 to 1790, but they were almost entirely confined to the south of France. At the time of its greatest expansion, in the 18th century, the Carthusian order numbered 172 houses (including five nunneries). Of these, 75 were in France, and were all destroyed at the time of the Revolution, except La Grande Chartreuse, which, however, the monks were compelled to abandon in 1903. Italy (where was the architecturally beautiful Certosa, near Pavia), Switzerland, and Spain were the other countries chiefly favoured by them. The nine houses in England suffered cruel persecution at the hands of Henry VIII. in 1535. Visitors to the Cartuja at Granada will see the sufferings of those English Carthusians depicted in a series of scenes in the Cloisters, the

work of Cotan, a Spanish brother. The *liqueur* manufactured by them at the Grande Chartreuse is not the least element of their fame. The name Carthusian is also applied to members of the Charterhouse school in England. See *The Carthusians*, a translation from the French, published in 1902.

**Cartier, SIR GEORGE ETIENNE** (1814-73), Canadian premier, born in Lower Canada. Becoming attorney-general for Lower Canada (1856), he was called to form the Cartier-Macdonald ministry in 1858. After the fall of his ministry he again became attorney-general (1864). A fearless and upright leader, and a good orator, he did much by his influence in Quebec for the moulding of a united Canada. He wrote French lyrics, published in 1875. See De Celles's *Life* (1904).

**Cartier, JACQUES** (1491-1557), discoverer of the Canadian river, St. Lawrence, born at St. Malo in France. He sailed in 1534 with two small vessels, touching at Newfoundland, and discovering New Brunswick. In a second voyage (1535-6) he explored the St. Lawrence, and took possession of the land he discovered in the name of Francis I. of France; he made a third in 1541. For the two first voyages see Lescarbot's *Histoire de la Nouvelle France* (1612); for the third, see Hakluyt's Collection.

**Cartilage**, the gristle or elastic substance in which bone is formed, and which remains permanently as the covering of the ends of bones in joints. Cartilage is white or bluish white, and semi-transparent. Three varieties of cartilage are generally described. (1.) *Hyaline*, so called because of its glassy semi-transparency, covers the ends of bones in movable joints, and forms the junction of ribs and breast-bone, and parts of the larynx and trachea. (2.)



*Fibrocartilage*, with parallel wavy fibres in the groundwork, is that form which is found, for example, between the vertebræ. (3.) *Elastic cartilage*. All cartilage has some elasticity, but the branched fibres in the matrix of this variety make it more elastic than the others. It is found in the ear, and, with hyaline cartilage, in the larynx. All bones are preformed in cartilage, with the exception of some of those of the head.

**Cartilaginous Fishes.** See ELASMOBRANCHS.

**Cartography.** See MAPS.

**Carton-pierre**, a papier-maché used in statuary and architectural decorations. It is a mixture of paper pulp, bole, chalk, and animal glue, and is made to imitate stonework.

**Carton**, R. C. (pseudonym of R. D. CRITCHETT), English dramatist, first attracted the London public by his serio-comic *Liberty Hall*, produced at St. James's Theatre by George Alexander. In 1895 *The Home Secretary* was produced at the Criterion by Sir Charles Wyndham. He has also written *Sunlight and Shadow*, *Robin Goodfellow*, *The Squire of Dames*, *The Tree of Knowledge*, *A White Elephant*, *Lord and Lady Algy*, *Wheels within Wheels*, *Lady Huntworth's Experiment* (the leading parts of the last four were written for his wife, Miss Compton), *The Undercurrent*, *Mr. Hopkinson*, and *Mr. Preedy and the Countess*, in which Miss Compton again took the leading part.

**Cartoon**, originally a full-sized drawing upon strong paper of a design to be carried out in oil paint, fresco, tapestry, stained glass, or mosaic. The design is transferred, by tracing or punching, from the cartoon to the panel or wall, when painting or mosaic is to be used; in tapestry, the main outline of the design having been traced on the warp, the

tapestry-worker, with the cartoon beside him, imitates it in coloured threads. The best known cartoons are those (1515-16) by Raphael for tapestries woven at Brussels for Pope Leo X. The seven which survive are in the Victoria and Albert Museum, South Kensington. Leonardo da Vinci's *Battle of the Standard* and Michael Angelo's *Pisa Cartoon* are equally famous in art history; but they have disappeared, and the designs are only known from engravings. Of recent years the term has been used to denote the semi-satiric drawings, dealing with political or social events, which appear in the humorous papers. In the latter sense it is now also applied to the caricatures of such men as Gillray, Rowlandson, and Cruickshank, which were issued as separate prints. Among modern cartoonists, the work of Sir John Tenniel, Sir F. C. Gould, and Linley Sambourne is the most notable.

**Cartouche**, properly a cartridge; but, until recently, the canvas bag in which cartridges were packed in the limber of a field gun. The name was also used to denote the old rifle cartridge box. It may also signify ornamental embroidery.

**Cartouche** (Fr. 'roll of paper'), an architectural ornament resembling a roll of paper, usually intended for an inscription or device. The name also signifies the modillions or ornamental blocks supporting the eaves of a house.

**Cartridge**, the charge of explosive necessary to propel a bullet or shell, together with its case or wrapping, and, in the smaller guns, its means of ignition. The old muzzle-loader cartridge consisted of powder and bullet wrapped in a cylinder of greased paper. To load it, the end was bitten or twisted off, the powder poured down the barrel, and the bullet with its greasy



paper forced after it, and hammered home with the ramrod. The introduction of the Enfield rifle into Bengal in 1857 is said to have had some part in kindling the Indian mutiny. The cartridge case of small calibre guns and small-arms is now of solid-drawn brass, with a percussion cap in its base, and is clinched over the base of the shell or bullet. Such ammunition is termed 'fixed.' The case is of about the same length as the cartridge chamber, and provides its own obturation. Pistol and revolver cartridges are manufactured on the same principle. Ignition is by a hammer striking the cap in the base of the cartridge, and so firing the charge. Large-bore sporting rifles and shot guns have, as a rule, a case of stout paper with a metal base. Some medium guns also have the charge contained in a brass cylinder; but, by reason of the weight, the shell is issued and loaded separately. This is termed 'separate ammunition.' In the base of the case is inserted an electric primer, an adapter, or a cap, according as the gun is fired by electricity or by percussion. Brass cases would be too heavy and expensive to use with the larger sizes of cannon, for which the charge is, as a rule, contained in a bag of serge, flannel, or silk, hooped round the body and choked at the neck. Serge and flannel are more particularly used for service charges; silk, being less liable to smoulder, for blank charges and for saluting. In loading cartridges, the sticks of cordite are laid lengthways; but prism powders are carefully built up in layers. In either case, ignition of the charge is often facilitated by the insertion above the cap of a primer of fine-grain powder.

*Blank cartridge* is used for saluting purposes and in manoeu-

vres. Except that the charge is smaller, it is similar to the ordinary cartridge.

**Cartwright, EDMUND** (1743-1823), English inventor, born at Marnham in Nottinghamshire; became rector of Goadby-Marwood in Leicestershire (1779), where he made agricultural experiments. He invented the power-loom (1784), and between 1789 and 1793 took out four patents for a wool-combing machine, for which he received a grant of £10,000 from government (1809). See his *Life* (1843).

**Cartwright, JOHN** (1740-1824), English political reformer, elder brother of the preceding. He wrote on political subjects—the ballot, universal suffrage, etc.—but was fined £100 for sedition (1820). Author of *England's Aegis* (1803-4), etc. See *Life* (1826).

**Cartwright, JULIA**, now MRS. HENRY ADY, English writer on art, was born at Edgcote in Northamptonshire; has written monographs on Raphael (1895), Sir E. Burne-Jones (1894), Millet (1896 and 1903), G. F. Watts (1896), Bastien-Lepage (1895), besides *Christ and his Mother in Italian Art* (1897), *Sacharissa* (1893), *Beatrice d'Este* (1899), *The Painters of Florence* (1901), *Millet* (1903), *Isabella d'Este* (1903), *Sandro Botticelli* (1904), *Raphael* (1905), *Life and Letters of Castiglione* (1908), and *Hampton Court* (1909).

**Cartwright, PETER** (1785-1872), an eloquent preacher of the American Methodists, known as the 'backwoods preacher,' born in Virginia. He published an autobiography of great interest (1856), and sat in the legislature of his state until defeated by Abraham Lincoln for Congress (1846).

**Cartwright, SIR RICHARD JOHN**, P.C. (1835), Canadian Liberal statesman, was born at Kingston. He became a member of the Old Canada Parliament in 1863,



and has almost continuously sat in the Dominion Parliament since the federation (1867). He was minister of finance (1873-8), acting-premier and leader in the House of Commons (1897), and became (1905) minister of trade and commerce. He acted as premier during Sir W. Laurier's absence at the Colonial Conference in 1907.

**Cartwright, THOMAS** (1535-1603), English Puritan divine, born in Herefordshire, and became (1569) Lady Margaret divinity professor at Cambridge. He was later (1570) deprived of office and imprisoned for nonconformity. He died master of a hospital at Warwick. Author of *Harmonia Evangelica* (1627).

**Cartwright, WILLIAM** (1611-43), English divine, poet, and dramatist, born at Northway, Gloucestershire; became reader in metaphysics at Oxford (1635). He took orders, and was famed not only for his plays, which hardly bear out his high contemporary reputation, but for his florid and eloquent sermons. An ardent royalist, he was appointed on the council of war (1642), and fell as a prisoner into the hands of Lord Say. He died of camp fever. See collected works, *Comedies, Tragicomedies, with other Poems* (1651).

**Carucate**, or CARRUCATE, a term of mediæval origin denoting a 'plough-land' or 'plough-gate'—i.e. as much land as could be tilled in one year by a single plough drawn by eight oxen. Canon Taylor observes that in old English deeds 'the normal carucate is either 120 acres or 80 acres by the Norman number (fivescore to the hundred), and 144 acres or 96 acres by the English number (sixscore to the hundred).' In the Lothians of Scotland a carucate consisted of eight 'bovates' or 'ox-gangs'—i.e. 104 acres. Dr. Skene points out that the carucate 'appears in Highland charters, but seems

sometimes to have contained 160 acres in place of 104.'

**Carúpano**, seapt., Venezuela, the chief commercial centre in the E. of the country, between the Araya and Paria peninsulas, 150 m. W. of the island of Trinidad. Coffee, cocoa, sugar, etc., are exported. Lead ore exists in the neighbourhood. Pop. about 12,000.

**Carus, JULIUS VIKTOR** (1823-1903), German zoologist, born at Leipzig. Keeper of the museum of comparative anatomy at Oxford (1849), he became professor of comparative anatomy at Leipzig (1853), and in 1873-4 was lecturer at Edinburgh University. His many estimable books include *Prodromus Faunæ Mediterraneæ* (1884-93), *System der Thierischen Morphologie* (1853), and a translation of Darwin's works. He edited the *Zoologischer Anzeiger* from its foundation (1878).

**Carus, KARL GUSTAV** (1789-1869), German physiologist and physician, born at Leipzig, became professor of midwifery at Dresden (1814), appointed court physician (1827), and finally was elected president of the Imperial Academy (1862). Among his numerous works on anatomy and physiology may be mentioned *Grundzüge zur Vergleichenden Anatomie* (1828), and *System der Physiologie* (1838-40). To his friendship with Goethe we owe *Goethe* (1843) and *Goethe und seine Bedeutung für Diese und Künftige Zeit* (1863). He published also *Lebenserinnerungen und Denkwürdigkeiten* (4 vols. 1865-6).

**Carus, MARCUS AURELIUS**, emperor of Rome (282-283 A.D.), was præfect of the prætorian guards under Probus, and when that emperor was murdered by the army in 282, became his successor by the choice both of troops and senate. After repelling a Sarmatian invasion into Illyricum, he



marched against the Persians, and overran Mesopotamia, capturing Seleucia and Ctesiphon. But when he was about to extend his march beyond the Tigris, he died suddenly from disease or treachery, or, according to the received story, from lightning.

**Carus, PAUL** (1852), American author, born at Ilseburg, Prussian Saxony; is editor of the *Open Court* and the *Monist* (Chicago). His works include *The Soul of Man* (1891), *Primer of Philosophy* (1893), *Monism: its Scope and Import* (1891-2), *Religion and Science* (1893), *The History of the Devil* (1900), *The Surd of Metaphysics* (1903), and several works on Buddhist subjects.

**Caruso, ENRICO** (1874), Italian opera tenor; born in Naples; studied with Lamperti and Concone; made first notable success at Naples (1896) in *Traviata*. He has since appeared in many of the cities of Europe and America in *Lucia*, *Manon Lescaut*, *Lohengrin*, *Fedora*, *Le Mascheré*, *Germania*, *La Bohème*, and other operas.

**Carutti, DOMENICO, BARON DI CANTOGNO** (1821), Italian historian, born at Cumiana, near Turin, of an ancient noble family. After writing novels and dramas, he was attracted towards historical research. He published *Dei Principii del Governo Libero* (1852; new ed. 1861), *Storia del Regno di Vittorio Amedeo II.* (1856; 3rd ed. 1897), and *Storia del Regno di Carlo Emanuele III.* (1859). In 1859 Cavour gave him an appointment in the Foreign Office. From 1862-9 he was ambassador in Holland, and in 1889 was made a senator. Among his other (numerous) works we mention *Storia della Diplomazia della Casa di Savoia* (4 vols. 1875-80), *Storia della Corte di Savoia durante la Rivoluzione e l'Impero Francese* (2 vols. 1892), and *Ricordi di Casa Savoia in Pinerolo* (1899).

**Carvajal, TOMAS JOSÉ GONZALES DE** (1753-1834), Spanish functionary and poet, born at Seville. A sturdy opponent of the new romantic school of poetry fashionable in Spain early in the century, Carvajal sought to follow the sweetness of the mystic poets of the 16th century, especially Luis de Leon. He translated into verse the Psalms, Isaiah, Job, the Song of Songs, etc. (1829-32); *Opusculos ineditos en Prosa y Verso*, 13 vols. (1847).

**Carvel**, or **CARAVEL**, a light, short, four-masted ship with a square poop, formerly used in Spain and Portugal; also a small vessel once used by the French for fishing herrings. *Carvel-built* is a term applied to a mode of planking the outside of a vessel, and is in contradistinction to *clinker* or *clincher built*. In a *carvel-built* craft the edges of the planks meet, but do not overlap.

**Carver, JOHN** (?1575-1621), leader of the Pilgrim Fathers who took refuge in Holland in 1607-8, and became agent for the expedition to New England. He left in the *Mayflower* on Sept. 6, 1620, and arrived in Massachusetts, where the town of New Plymouth was built.

**Carver, JONATHAN** (1732-80), American geographer, was born at Stillwater, Connecticut. Retiring from the army after five years' service (1757-63), he proceeded (1766-8) west, and explored much of what is now the state of Minnesota and other parts of the Mississippi valley. In 1778 he published his *Travels to the Interior Parts of N. America*. See Gregory's *J. Carver: his Travels*, etc. (1896).

**Carvin, tn.**, Pas de Calais dep., France, 18 m. N.E. of Arras; has distilleries, coal mines, and brass and iron foundries. Pop. 10,700.

**Carving** is the art or act of cutting ornamental or naturalistic forms in stone or marble, ivory



or wood. As a rule, work in stone or marble, whether in the form of separate figures or groups or of important figure-reliefs, is called sculpture. The less important carved ornament on buildings is described as architectural carving or sculpture, and the word carving is applied in a special sense to work in ivory and its substitutes and in wood. Used in this restricted way, carving is one of the oldest of the arts, and among half-civilized or savage peoples it is usually found in greater perfection than flat-coloured decoration. The carved or incised bones found in prehistoric caves in France are perhaps the oldest art objects known, and in Egypt and Nineveh carved work in ivory dates from early times. In Greece ivory was used for many ornamental purposes, and several famous statues, such as the colossal figures of Athene at Athens and Jupiter at Olympia, were executed in ivory and gold. From late Roman times there is an almost unbroken series of examples of the art. Under Byzantine influence Eastern forms of surface decoration became evident, and figure work, almost entirely religious in motive, became stiff and formal. The mediæval period, which followed, has left many fine pieces, and of these several of the most beautiful and spirited are French. The ecclesiastical work (shrines, altar-pieces, crosiers, book covers, statuettes) is full of the spirit of the Gothic church builders; the domestic (mirror cases, combs, caskets, horns, etc.) of the chivalry of the age; and in the embellishment of both, colours and gold were freely used. The early renaissance produced numerous fine carvings of a similar kind, but more delicate in treatment, completer in form, and showing classical influences; and many connoisseurs consider the work of the 16th century the best extant.

Gradually, however, refined invention died out, imitation gained the ascendant, and cleverness is almost the sole merit of many elaborate pieces of the 17th and 18th centuries. Ivory is also a favourite material in India, China, and Japan; but while Eastern carvers show great skill and possess a sense of the grotesque, their figure work is usually debased.

Wood-carving is probably of even greater antiquity than ivory-carving, the wooden sculpture of Egypt being the earliest that survives; and although wood-carving was practised in Greece and Rome, it is not until the mediæval period that authentic examples are again available. These, of course, partake of the architectural styles of the periods to which they belong. In churches, particularly in the north of Europe, statuettes, shrines, and elaborate altar-pieces, carved in wood, gilded and coloured, were common, and stall-work and screens were often both elaborate and fine. In the same countries the fronts of the timbered houses presented a great field for the carver, and inside roofs and panellings were often carved. In Italy and in France, where also Italian influences were strong, carved furniture was also in fashion, and during the 16th and 17th centuries it was specially elaborate; but towards the end of that period marquetry came in, and this fashion, combined with ormolu mounts, marks 18th-century furniture, particularly in France. During the late 17th century Grinling Gibbons, a Dutchman, introduced into England a style of wood-carving which had great and persistent influence there; but, though very elaborate, and in itself exceedingly well done, it had no architectural basis, and always looks as if it were unnecessary and stuck on. For technical details see ENGRAVING and WOOD-EN-



GRAVING; compare also SCULPTURE. See *Practical Wood-carving* by Eleanor Rowe (1907); and *Wood-carving Designs* by Muriel Moller (1906).

**Cary, ALICE** (1820-71), American writer, born near Cincinnati, Ohio. Her rural sketches first attracted attention. Her writings are characterized by grace and naturalness, the most popular being *Hagar* (1852), *Married, not Mated* (1856), and *The Bishop's Son* (1867). — **PHŒBE**, her sister (1824-71), wrote some volumes of verse. A selection of the *Early and Later Poems* of both sisters was published in 1887. See Mrs. M. C. Ames's *Memorial* (1873).

**Cary, HENRY FRANCIS** (1772-1844), translator of Dante, born at Gibraltar; published his translation of the *Inferno* (1805), followed by the whole of the *Divina Commedia* (1814), which still holds a foremost rank. See *Memoir* by his son (2 vols. 1847).

**Caryatides** (Gr. *Caryatis*), an architectural term signifying those draped female figures, in Hellenic buildings usually of the Ionic style, which supply the place of pillars. One of the finest examples of caryatides occurs in the Erechtheum in Athens.

**Caryocar** (*Caryocar butyrosomum*, or *C. nuciferum*) is a tree about eighty feet in height, a native of tropical America. It is chiefly celebrated for the kernels of its four-celled drupes, known as butter-nuts, which are embedded in a mealy pulp, and consist of a delicious, white, oily, jelly-like mass, covered by a membrane. The timber is used for house and boat building.

**Caryophyllaceæ**, an order of flowering plants characterized by the pistil being syncarpous, the leaves entire and opposite, placenta free central, the stem swollen at the nodes, calyx and corolla each of five parts.

Among the chief genera may be named *Cerastium*, *Stellaria*, *Dianthus*, *Lychnis*, *Silene*, and *Saponaria*.

**Caryota**, a genus of spineless palms with bipinnate leaves, the genus which is sometimes known as the fish-tail palms, from the shape of the leaflets. When fully grown the plants bear large green or purple flowers, the spadices hanging down in graceful bundles. The caryotas are easily grown in a warm house in a mixture of loam, leaf-mould, peat, and sand; they may also be grown out of doors in mild localities in summer. Propagation is by seeds or by suckers. Among the species may be named *C. Rumphiana*; the wine-palm, *C. urens*, which reaches a height of over forty feet; and *C. sobolifera* or *C. mitis*.

**Casa, GIOVANNI DELLA** (1503-56), Italian writer, born in the Mugello valley, near Florence. Pope Paul III. made him archbishop of Benevento and nuncio at Venice (1544), where he distinguished himself as a violent opponent of the Protestants; and appointed him secretary of state, a post he held till his death. His lyrics, letters, and speeches are excellent of their kind, but his fame rests chiefly on the little book, *Il Galateo, ovvero de' Costumi* (written between 1551-5; Eng. trans. 1576; new ed. 1892), which, with Castiglione's *Cortegiano*, presents us with an admirable picture of the court manners of the Italian renaissance. The best edition of the *Opere* is that of Forcellini, in 3 vols. (1752); a selection appeared at Milan in 1879. A Life by Casotti was prefixed to the Florentine edition of 1707.

**Casaba.** See KASSABA.

**Casabianca, LOUIS DE** (1755-98), French naval officer, born in Corsica; was mortally wounded at Aboukir (the battle of the Nile),



and perished with his burning ship, his little son declining to desert him. See poems by André Chenier and Mrs. Hemans.

**Casa Blanca**, or DARELBEIDA, seapt. tn., w. coast of Morocco, 50 m. N.E. of Mazagan. It exports chick peas, grain, hides, and wool. The imports amount to about £570,000 and the exports to £450,000 annually. In 1907 the town was bombarded and occupied by French troops. Pop. 20,000.

**Casacalenda**, tn., Abruzzi e Molise, Italy, prov. of and 16 m. N.E. of Campobasso. Pop. 7,000.

**Casale**, or CASALE MONFERRATO, fort. tn. and episc. see, prov. Alessandria, Italy, 21 m. by rail N.W. of Alessandria, on the r. bk. of the Po. The cathedral dates from the 8th and 12th centuries. There are some other interesting churches (San Domenico, begun in 1489) and private palaces (one with frescoes by Giulio Romano). From 1474 it was the capital of the old marquisate of Monferrato. Pop. 32,000.

**Casalmaggiore**, tn., N. Italy, prov. of and 22 m. E.S.E. of Cremona; manufactures pottery, glass, leather, and chemicals, and has a fine cathedral, theatre, and college. Pop. (comm.) 17,000.

**Casalpusterlengo**, tn., prov. Milan, Italy, 11 m. N. of Piacenza, with a trade in Parmesan cheese. Pop. 6,000.

**Casamance**, riv., W. Africa, in the French colony of Senegal; forms a wide estuary which enters the ocean in about 12° 30' N.

**Casamassima**, tn., Apulia, Italy, prov. of and 14 m. S. of Bari. Pop. 8,500.

**Casamicciola**, tn., Italy, on isl. of Ischia (Gulf of Naples); has been entirely rebuilt since 1883, when the former town was overthrown by an earthquake. It possesses hot mineral waters (150° F.), which attract many

visitors between May and August. Pop. 3,800.

**Casanova**. (1.) GIOVANNI GIACOMO DE SEINGALT (1725-98), Venetian adventurer, remarkable for his wit, accomplishments, and intrigues. He travelled from capital to capital in Europe, frequenting the most aristocratic society, and leading a vicious life. Besides a translation into verse of the *Iliad*, he wrote *Memoirs* (12 vols. Leipzig, 1828-38), which are vastly entertaining as a picture of the corrupt manners of his time. (2.) GIOVANNI BATTISTA (1722-95), his brother, was a painter, and became professor in the Academy of the Fine Arts, Dresden. He wrote *Monumenti Antichi*. (3.) FRANCESCO (1730-1805), another brother, born in London, was also a painter, who obtained a high reputation in Paris for battle-pieces and landscapes, and also in Vienna, where the Empress Catherine II. of Russia employed him to illustrate her victories over the Turks. His pictures exist in Rouen, Nancy, Lyons, and other French towns; and his *Ferry Boat* hangs at Dulwich College, London.

**Casarano**, tn., Apulia, Italy, prov. of and 22 m. S. of Lecce. Pop. 9,000.

**Casares**, tn., Malaga prov., Spain, 18 m. N. of Gibraltar, with copper mines, marble quarries, and mineral springs. Pop. 5,700.

**Casas Grandes**. (1.) Anc. tn. in state of Chihuahua, Mexico, 130 m. S.W. of El Paso. It has buildings (now in ruins) erected by the Pueblo Indians, and discovered by the Spaniards in 1660. (2.) The remains of a prehistoric city in Pinal co., Arizona, U.S.A., about 50 m. N.N.E. of Tucson.

**Casati**, GAETANO (1838-1902), Italian explorer, born at Lesmo, near Monza. At the request of the Commercial Geographical



Society of Milan he undertook a journey to the Sudan, during which he explored the region of the river Welle-Makua, and (1881) met the German traveller Junker. In 1883 he arrived at Lado, where he joined Emin Pasha. In 1888 he had a narrow escape, being condemned to death by Kabba Rega, king of Unyoro, to whom he was sent on a mission by Emin Pasha. In 1889 he returned to Italy, and published *Dieci Anni in Equatoria e ritorno con Emin Pascha* (1891).

**Casaubon, ISAAC** (1559-1614), Swiss classical scholar, born at Geneva, became professor of Greek there (1582) and (1596) at Montpellier. He next became royal librarian at Paris; but on the death of Henry IV., who protected him, his pronounced Protestantism made it advisable for him to leave Paris. Settling in London in 1611, he wrote a confutation of Cardinal Baronius, which laid him open to the charge of having been hired by James I. Casaubon, whose zeal in the accumulation of knowledge was ceaseless, belonged to the class of humanists who devoted themselves to wide and catholic research. He was appointed prebendary of Canterbury and Westminster, and was buried in Westminster Abbey. Besides publishing editions of Athenæus (1600), Aristotle (1590), Polybius (1609), Strabo (1587), Persius (1605), and other classical writers, Casaubon was the author of the following works: *De Satirica Græcorum Poësi et Romanorum Satira* (1605), *De Libertate Ecclesiastica* (1607), and *Exercitationes contra Baronium* (1614).—Casaubon's son, **MERIC CASAUBON** (1599-1671), was also a distinguished scholar, appointed professor of theology at Oxford. He published a defence of his father, wrote several Latin works, and edited Terence, Marcus Aurelius,

Epictetus, etc. See *Casauboniana* (1710); Casaubon's *Ephemerides*, ed. by J. Russell (1850); *Isaac Casaubon*, by Mark Pattison (1875; 2nd ed. 1892); and Nazelle's *I. Casaubon, sa Vie et son Temps* (1897).

**Casca**, PUBLIUS SERVILIUS, tribune of the plebs at Rome in 44 B.C., and one of the murderers of Cæsar. He fell in the battle of Philippi (42 B.C.).

**Cascade**, mountain range in N.W. of the United States, traversing, with a N. and S. trend, the states of Washington, Oregon, and N. California. Except in N. Washington, where it is composed chiefly of granites, it is a volcanic range, covered by successive flows of lava. With a general summit elevation of from 6,000 to 7,000 ft., rising to 8,000 ft. or more in N. Washington, the range bears on its crest or flanks many extinct volcanoes, such as Shasta, in California (14,392 ft.); Jefferson (10,350 ft.) and Hood (11,225 ft.), in Oregon; and Adams (12,470 ft.), St. Helens (10,000 ft.), Rainier (14,526 ft.), and Baker (10,827 ft.), in Washington. See Smith and Calkin's *Geological Reconnaissance across the Cascade Range*.... (1904).

**Cascara Bark** is obtained from a small tree which belongs to the natural order Rhamnaceæ, and grows abundantly in N. California. It is collected in spring and early summer, when it is easily peeled from the wood, and when dried curls into quills. The fluid extract (*cascara sagrada*) prepared from the dried bark of *Rhamnus Purshiana*, is used in medicine as an aperient. It is used either as a dry or as a liquid extract (officinal), and is believed to act chiefly on the muscular coats of the intestine. For continued use it should not be taken in large single doses, but in small doses repeated twice or thrice a day before meals, the doses



being gradually lessened as soon as possible.

**Cascarilla Bark** is obtained from the twigs and branches of *Croton Eleuteria*, a small tree of the Euphorbiaceæ, found in the Bahama Is. Its outer layer is a grayish-white cork, with a checkered appearance. The bark has a pleasant aromatic odour, and an aromatic but disagreeably bitter taste; when burned, it gives an agreeable scent, and is therefore used in incense.

**Cascina**, comm., Tuscany, Italy, on riv. Arno, prov. of and 7 m. E.S.E. of Pisa; with cotton, linen, soap, and silk industries. Here in 1364 the Florentine mercenaries defeated those of Pisa. Pop. (comm.) 26,000.

**Case**, the grammatical term for the various inflectional forms of the substantive parts of speech. Modern English has two cases in the noun—viz. the nominative, or normal form of the substantive, and the genitive or possessive, expressing origin: 'men's sons.' In the pronoun we have, in addition, the dative, expressing the direction of an action—'I gave it *him*;' and the accusative, denoting the object of the action—'I saw *him*.' Other Indo-European languages possess a vocative case, used in direct address; an ablative, answering to our prepositions 'with' or 'from;' an instrumental, 'by means of;' and a locative, 'in' or 'at.'

**Case**, in law. The 'action of trespass on the case' was one of the old forms of action (*q.v.*). It was an adaptation of the earlier writ of trespass to cases for which no special writ was provided, and was used to recover consequential as distinguished from direct damages—*e.g.* damages for breach of contract or for slander. See SPECIAL CASE, CROWN CASES RESERVED (COURT OF), TRIAL.

**Case**. See PRINTING.

**Caseation** (Lat. *caseus*, 'cheese') is an advanced stage of degeneration in animal tissues, in which they become of a cheese-like consistency. It is particularly associated with tuberculous conditions. See TUBERCLE.

**Case-hardening**, the operation by which wrought iron is hardened by converting the surface into steel. Tools, keys, fire-irons, parts of machinery, etc., to be hardened are packed into an iron box with charcoal, derived from horn, leather, etc., and heated to dull redness for varying periods, according to the size of the article and the thickness of coating required. The carbon enters into combination with the iron, and produces a superficial layer of steel, by much the same action as that by which steel is obtained in the cementation process. Potassium ferrocyanide is often sprinkled on the red-hot iron to supply the carbon. Various modifications of this principle are in use, notably the Harveyizing of steel armour plates, which consist, for the most part, of a tough malleable steel, but are coated externally with an intensely hard surface.

**Casein**, a proteid which is formed in milk, and is the principal constituent of cheese. Under the influence of rennet or acids it separates, and produces curd or casein. The casein precipitated by acid differs in several important respects from that precipitated by rennet; for the latter is coagulated, contains phosphates, and is a valuable and concentrated food product. In the milk this proteid is combined with the phosphate of lime; on the addition of acid, the alkaline phosphate is converted into an acid phosphate, and the casein becomes insoluble. See CHEESE. Under the influence of formaldehyde casein sets to a hard mass. See FORMALDEHYDE.



**Case-making Machine.** See BOOKBINDING.

**Casemate**, in modern military engineering, a bomb or shell proof chamber, usually erected upon or under the parapet of a fortification, and used as a shelter for guns, barracks, magazines, and hospitals. Casemates in permanent fortifications are constructed of masonry or concrete, the vaulted roof being covered with earth of a thickness sufficient to resist the penetrative power of an exploding shell.

**Casement**, a wooden frame on hinges which keeps the glass of a window in position.

**Casentino**, picturesque valley of the upper Arno, in the province of Arezzo, Italy. It was celebrated by Dante, and is now a much-frequented tourist resort. See Noyes' *The Casentino and its Story* (1906).

**Caserta.** (1.) Province of Italy, called Terra di Lavoro down to 1871, and forming part of Campania; stretches from the S. Apennines (7,250 ft.) s.w. to the Tyrrhenian Sea. In spite of its mountainous character it is very fertile, and yields wheat, forage crops, wine, olives, fruits, timber, marble, and fish. Area, 2,033 sq. m. Pop. 800,000. (2.) Town and episc. see of Italy, cap. of above prov., 17 m. N. by E. of Naples; it has grown up around the royal castle built here in 1752 by Charles III. of Naples. Large silk works near. Pop. 33,000.

**Case-shot** or CANISTER. See AMMUNITION.

**Cash**, that which was usually contained in the strong-box—money. In modern commercial language, cash includes not only specie or coin, but bank notes and even cheques—in fact, all money or money payable on demand, in contradistinction from bills or other securities.

**CASH BOOK.** See BOOKKEEPING.

**CASH NOTE.** An old name for a

'goldsmith's note' (see BANK); its modern equivalent is a cheque.

**CASH ON DELIVERY SYSTEM.** Method in vogue in India, Egypt, New South Wales, Austria-Hungary, Belgium, France, Germany, Holland, Italy, Japan, and Switzerland, whereby postal authorities, railway companies, and other carriers not only deliver goods to a purchaser, but collect the sale price and transmit it to the vendor. The system has been strikingly successful in India and Germany. Efforts have been made to induce the British postal authorities to put the system into force; but the strong opposition of the smaller retail traders, who believe that they would be swamped by the larger traders, has so far been effectual in preventing its adoption. In a report (March 31, 1904) the postmaster-general (Lord Stanley) showed himself favourable to the scheme, but subsequently announced that he was not prepared to put it into operation, though he hoped to assist in some method which would facilitate exchange of commodities between this country and the colonies. At present the system is in operation between the United Kingdom and certain British possessions, Egypt, and a few foreign countries like Turkey and Morocco. The amount to be collected under the cash on delivery system, which is called the 'trade charge,' must not on any packet exceed £20. The delivery fees charged in the United Kingdom vary from 4d. when the trade charge is under £5 to 1s. when it is over £15. For the charge duties, see *Post Office Guide*.

**Cashel**, city, Ireland, in co. of and 12 m. E. by N. of Tipperary. Ruins of the cathedral founded in the 12th century, with remains of an abbey, palace, and round tower, form a conspicuous group on the summit



of a bold limestone mass, the 'Rock of Cashel.' The parish church of St. John now serves as the cathedral. The famous 'Synod of Cashel' was held here in 1172. Pop. 3,000.

**Cashew Nut.** The cashew tree (*Anacardium occidentale*) is a native of S. America and the W. Indies, and is largely cultivated in the warmer parts of the United States. It grows to a height of thirty feet or over, and is valued for its kidney-shaped nuts and fleshy, pear-shaped red or yellow peduncles, both of which are edible. The kernel of the nut is usually roasted before being eaten.

**Cashgar.** See KASHGAR.

**Cashibos,** a fierce Peruvian tribe who eat the infirm and aged of their own people, and generally live in scattered groups like wild beasts in the Amazonian woodlands. Physically they are a fine race, of very light complexion, and the missionary Girbal was surprised at the beauty of their women.

**Cashiering** (Old Fr. *casser*, to discharge). 'Scandalous conduct unbecoming the character of an officer and a gentleman' is punished in the British army by cashiering—*i.e.* cancellation or annulment of commission. This sentence, as distinguished from dismissal, renders the officer absolutely incapable of serving the Crown again.

**Cashmere.** See KASHMIR.

**Cashmere Goat,** a breed of the domesticated goat (*Capra hircus*), remarkable for the thick undercoat of wool which occurs beneath the long hair. It is a rather small variety, with pendent ears and long, flattened horns, which are curved outwards and backwards, and have a sharp edge in front. It is most abundant in Tibet, but is also bred by the Kirghiz in Central Asia. There is considerable vari-

ation in colour, the animals being sometimes of a uniform white tint, and at others dark brown or even black. The undercoat is combed out in summer, and is used in the manufacture both of shawls and of a very fine and soft cloth. Attempts have been made to acclimatize the Cashmere goat in various countries of Europe, but the only one which has really been successful is that which introduced them into France in 1819.

**Cash Register.** See MACHINES, AUTOMATIC.

**Casimir-Périer, JEAN PAUL PIERRE** (1847-1907), French statesman, was born in Paris. On the formation of a purely republican cabinet in 1877, he was appointed under-secretary of public instruction, and retained the post until the Dufaure cabinet went out of office (1879). He retired from the Chamber (February 1883) when the law was passed excluding members of French royal families from public employment—conduct which, though in accordance with family tradition, caused him to be suspected of leanings towards the Orleanists. Re-entering Parliament, he was appointed under-secretary for the war department (October 1883), but retired with his chief, General Camperan (January 1885). Owing to his personal influence with the republican majority, he was elected (1890) vice-president of the Chamber, and in 1893 president. From December 1893 to May 1894 he was prime minister and minister for foreign affairs. On the assassination of President Carnot, in June 1894, Casimir-Périer, at the time president of the Chamber, was elected president of the republic, but resigned on January 15, 1895.

**Casing.** See BOOKBINDING.

**Casino,** or KURSAAL, an establishment very popular on the Continent for the promotion of



social intercourse. The building, generally one of the most handsome and important in watering-places and other holiday resorts, contains conversation, dancing, music, reading, billiard, and other rooms. The casino has no direct representative in Great Britain.

**Cask.** See COOPERAGE.

**Casket Letters,** certain documents which, according to a declaration made by the Earl of Morton, afterwards regent of Scotland, were found by him on June 20, 1567, in a silver casket taken from a servant of Bothwell, husband of Mary Queen of Scots, and broken up in the presence of numerous important witnesses, by whom the documents were 'sighted'—i.e. carefully examined. The documents were: (1) an undated promise (in French) by Mary of marriage to Bothwell; (2) a marriage contract in Scots, professedly subscribed by Mary and Bothwell; (3) eight letters (in French) supposed to have been written by Mary to Bothwell; (4) a series of French sonnets. The letters and sonnets, if genuine, implicate Mary in the murder of Darnley. None of the originals are now known to survive. Latin translations of Letters I., II., and IV. (III.) were published in Buchanan's Latin version of the *Detection* (1571); Scots versions of all the letters were appended to the Scottish edition of the *Detection* (1571 and 1572); and seven letters in French—Letter III. (VIII.) being omitted—were appended to the French version published in 1572. The only copies of the original French versions that have yet been discovered are those of III. (VIII.) and V. (IV.) in the Record Office, London, and those of IV. (III.) and VI. (V.) at Hatfield.

In 1754, Walter Goodall, in his *Examination of the Letters said to have been written by Mary Queen of Scots to James, Earl of*

*Bothwell*, proved that the published French versions were translations from the Scots or Latin, and he therefore concluded that there never were any French originals; but a study of the French and English versions at Hatfield and the Record Office has rendered Goodall's position untenable. Within recent years discussion has centred mainly round the long and remarkable Letter II., the main obstacle—apart from the supposed external ones—to its acceptance as genuine being the correspondence of part of it with the declaration of Thomas Crawford, a servant of Bothwell. On account mainly of evidence recently discovered in the Lennox MSS. at Cambridge, Mr. Andrew Lang, in *The Mystery of Mary Stuart* (1901), has arrived at the conclusion that this letter, which he regards as partly genuine and partly forged, has been substituted for a forged letter which he supposes the Scottish commissioners deemed it advisable to suppress.

The genuineness of the Casket Letters has been credited by most of the principal historians of the period, including Hume, Robertson, Laing, P. F. Tytler, Hill Burton, and Froude. Nevertheless, from the time of Goodall's *Examination* their genuineness has been the theme of a controversy which has had very varying fortunes. The following works may be mentioned as representing the more important fluctuations of the controversy:—Whitaker's *Mary Queen of Scots* (1778); Tytler's *Inquiry* (1790); Laing's *Dissertation* (1804); Mignet's *Life* (1851); Hosack's *Mary Queen of Scots and her Accusers* (1869; 2nd ed. 1870-74), and *Mary Stuart* (1888); Skelton's *Impeachment of Mary Stuart* (1876), and *Maitland of Lethington* (1887-8); Bresslau's *Die Kassettenbriefe* (1882); Sepp's *Die Kassettenbriefe* (1884); Gerdes's *Ge-*



*schichte der Königin Maria Stuart* (1884); Henderson's *Casket Letters* (1889; 2nd ed. 1890); Philippson's *Hist. du Règne de Maria Stuart* (1891-2); Cowan's *Mary Queen of Scots, and who wrote the Casket Letters* (1901); and Lang's *The Mystery of Mary Stuart* (1901), which also discusses the more important aspects of the subject.

**Caskets**, or CASQUETS, dangerous group of islands in English Channel, 8 m. w. of Alderney; the scene of the wreck of the *White Ship* (1120), of the *Victory* in 1744, and of many other vessels. Victor Hugo has immortalized them in his *Toilers of the Sea* (trans. 1886).

**Caslau**, or CZASLAU, tn., Austria, in the E. of Bohemia, 45 m. E.S.E. of Prague, with sugar and other factories. It was one of the chief towns of the Hussites. Pop. 9,000.

**Caslon**, WILLIAM (1692-1766), the first great typefounder that England produced, was born at Cradley, Worcestershire. Aided by Bowyer and other printers, he set up in business in a small way in St. Luke's, London. For many years few books of any importance were printed with the types of any other foundry. Caslon took as his model the types of the Elzevir family.

**Casoli**, comm., Abruzzi e Molise, Italy, prov. of and 18 m. S.S.E. of Chieti. Pop. 7,000.

**Casoria**, tn., Italy, in prov. of and 5 m. N.N.E. of Naples; produces wine and silk. Pop. (comm.) 13,000.

**Caspari**, CARL PAUL (1814-92), German scholar and theologian, born at Dessau, and appointed, in 1857, professor of theology at Christiania—a chair he held till his death. Besides theological and philological studies, including an Arabic grammar (5th ed. 1887), he published *Kirchenhistorische Anekdoten* (1883), and *Quellen zur Geschichte des Taufsym-*

*bols und der Glaubensregel* (4 vols. 1866-75).

**Caspe**, tn., Spain, in prov. of and 50 m. S.E. of Saragossa; one of the most ancient cities in Spain. The well-known sulphur baths of Fonte are near. Oil and silk are produced. Pop. 7,800.

**Caspian Sea**, a salt lake, the largest inland sheet of water on the earth, lies on the border-line between the W. of Asia and the E. of Europe (Russia), with Persia at its S. extremity. Its longest axis stretches from N. to S., a distance of 760 m., while its width varies from 115 to 280 m., and its area covers 170,000 sq. m. The shores are for the most part low, flat, and sandy, but show a cliff-like character along the face of the Ust-Urt plateau in the N.E. and along the S., where the narrow Persian coast provinces of Gilan and Mazanderan are backed by the lofty range of the Elburz. On the W., again, the eastern extremity (Apsheron) of the Caucasus pushes itself out into the sea. Its surface lies 84 or 85 ft. below the level of the Black Sea, but itself fluctuates to the extent of 3 or 4 ft., according to the season. In spite of the fact that it receives the largest river in Europe, the Volga, as well as the Ural, Atrek, Kizil-Uzen, Kuma, and Terek, the Caspian is slowly shrinking, chiefly in consequence of the vast evaporation. At no very distant geological period this sea was one with the Sea of Aral, and was connected not only with the Black Sea by way of the Sea of Azov, but also in all probability with the Arctic Ocean. The bottom appears to be divided into three basins, varying in depth from 26 to 500 fathoms. Enormous quantities of sturgeon and shad are taken every year, especially in and near the estuary of the Volga. The principal seaports on the W. shore are Astrakhan, Petrovsk, Derbent, Baku, Lenkoran;



on the s. or Persian shore, Resht, Enzeli, and Astrabad; and on the Asiatic or E. coast, Krasnovodsk and Mikhailovsk. Russia maintains a small fleet on the Caspian. The Caspian is connected with the Baltic Sea by way of the Volga R. by means of canals, and it is proposed to connect it with the Sea of Azov and the Black Sea by way of the Don and Volga Rs., and a canal at Tzaritzin.

**Cass, LEWIS** (1782-1866), American general and politician, born at Exeter, New Hampshire. He was appointed governor of Michigan (1814), and negotiated many treaties with the Indians. In 1831 he held the office of secretary for war; in 1836 was sent as ambassador to France; in 1842 was elected a senator of the United States, and nominated as Democratic candidate for the presidency in 1848, but was defeated. In 1857 he became secretary of state, an office he resigned in 1860.

**Cassaba.** See KASSABA.

**Cassagnac, ADOLPHE BERNARD GRANIER DE** (1806-80), French journalist and politician, born in the department of Gers. In 1832 he started in Paris as a journalist of the extreme type, his violent articles leading him into innumerable duels and lawsuits. He was a decided opponent of the emancipation of the slaves (1837); adverse to the revolution of 1848; allied himself with Louis Napoleon in 1852; and from that year to 1870 represented Gers in the Assembly. In Parliament as well as in the press, especially in *Le Pays*, a paper founded by him in 1866, he vigorously opposed liberal ideas and liberal reforms. After the fall of Napoleon III. he became a prominent member of the Bonapartist party. Cassagnac left several historical works: e.g. *Histoire des Classes Nobles et des Classes Anoblies* (1840), *Histoire des Causes de la Révolu-*

*tion Française* (1850), *Souvenirs du Second Empire* (1879-82).

**Cassagnac, PAUL ADOLPHE MARIE PROSPER DE GRANIER DE** (1843-1904), French journalist and politician, son of Adolphe Cassagnac, was born in Paris. In 1866 he became director, and subsequently editor and duellist, of *Le Pays*, encountering, among other fighting men, Flourens, Ranc, and Rochefort. An important member of the Bonapartist party, he took a prominent part in every agitation for the overthrow of the republic. He was a member of the Assembly almost uninterruptedly after 1876, though his otherwise brilliant oratory was marred by the violence of his language. In 1886 he founded the paper *L'Autorité*. Having deserted the Bonapartists, he was one of the committee of six who arranged with General Boulanger his *coup d'état* (1889). He was the author of *Empire et Royauté* (1873), *Mémoires de Chislehurst* (1873), *Histoire Populaire Abrégée de Napoléon III.* (1874-5), etc.

**Cassander** (d. 297 B.C.), son of Antipater, the general, and one of the successors, of Alexander of Macedon. Cassander having seized Athens (318), put to death Olympias, Roxana, and Alexander Ægus (mother, wife, and son of Alexander the Great), and established himself in 301 B.C. as king of Macedonia. In 315 B.C. he had rebuilt Thebes, destroyed by Alexander twenty years before.

**Cassandra**, one of the daughters of Priam, king of Troy, and Hecuba. After the fall of Troy she became the captive of Agamemnon, and with him was murdered by Clytæmnestra and Ægisthus after their return to Greece. She had the gift of prophecy, but her warnings were disregarded; hence her name is applied to any one who utters gloomy views about the social or political future.



**Cassandra** (anc. *Pallene*), the most westerly of the divisions of the Chalcidice peninsula, jutting into the Ægean Sea between the Gulfs of Salonica and Cassandra (anc. *Toronaicus Sinus*).

**Cassano.** (1.) Town and episc. see, Italy, 34 m. N. of Cosenza, with hot sulphur baths. Pop. 8,700. (2.) Town, Italy, on the Adda, 16 m. by rail E. by N. of Milan, with silk industries, but chiefly famous for the battles fought here: the French defeated the Austrians under Prince Eugene in 1705, and the French under Moreau were defeated by the Austrians and Russians in 1799. Pop. 8,800.

**Cassans**, tn., Apulia, Italy, prov. of and 16 m. s.s.w. of Bari. Pop. 6,000.

**Cassation**, COURT OF, the supreme judicial authority in France. Its function consists in observing that, in the administration of justice by the different tribunals, the law has been properly applied. It does not enter into the merits or process of the litigation, but confines itself to the purely legal aspects of the case. The appeal can only be made by the parties to the suit, and only after every other means of appeal has been exhausted. If the appeal is rejected, the judgment already given becomes final; if the appeal is allowed and the judgment given is quashed, the case is sent back to a tribunal of the same degree as that which tried the case originally, in order that it may be retried. It is only very exceptionally that a judgment is quashed without being sent back to another tribunal. Besides the parties to the suit, an appeal can be made by the *procureur-général* of the Court of Cassation, either at the request of the French home secretary, or in his own name, when he has reason to believe that a flagrant violation of the law has taken place, or a tribunal

has acted *ultra vires*. The decisions of all the French courts are subject to appeal in this way, except the judgments of justices of the peace, of the commercial tribunals in matters of less than £75, and the decisions of the Cassation Court itself. When it happens that, in the case of a judgment which has been quashed by the Court of Cassation and sent back to another tribunal for retrial, the decision arrived at by that tribunal is the same as the decision of the original trial, and when an appeal is again lodged, the Court of Cassation holds a plenary sitting—*i.e.* of all three divisions united—and its decision is then obligatory, and is sent to the last tribunal to be enforced. The Court of Cassation has also the power of revision and the right of disciplinary jurisdiction and censure over the magistrature.

The Court of Cassation was constituted by the National Assembly in 1790. Its members are chosen from among the presidents or procureurs of the court of appeal, high functionaries at the ministry of justice, law professors, and eminent members of the bar at the Court of Cassation. They hold office for life or till they reach the age of seventy-five, and are appointed by the president of the republic upon the recommendation of the home secretary. The court is divided into three divisions—Court of Requests, Civil Court (both for civil suits), and Criminal Court; and to each court fifteen judges are attached, with a president in addition. Besides these, there is the first president of the entire court. See Chénon's *Origines, Conditions, et Effets de la Cassation* (1882).

**Cassava**, MANIOC, or TAPIOCA TREE (*Jatropha Manihot*, or *Manihot utilissima*) is a tropical shrub about six feet in height, with a large tuberous root which contains



a milky juice of a very acrid taste. The natives of the west coast of Africa use these roots largely as food; they have something of the taste and quality of parsnips. When freed from juice, grated, and baked, they are also eaten under the name of cassava bread. The condiment cassareep is made largely from the grated roots. The juice is sometimes extracted and fermented, and so becomes the beverage known as piwarry. But it is as the source of tapioca that the cassava is of the greatest importance, this product being a pure starch, which is prepared by pulping the root, washing out the starch, collecting it, and drying it on heated plates.

**Cassel.** See KASSEL.

**Cassel, SIR ERNEST**, financier, born in 1852, the son of Jacob Cassel, a banker at Cologne. He began life in a grain merchant's office in Liverpool, but soon after found employment in London. He financed the great Assouan dam in Egypt, and the Swedish railways, and he helped to bring the London 'Twopenny Tube' railway into being. He also assisted in the negotiating of three State loans for Mexico, and raised a loan for China after the war with Japan. A personal friend of King Edward VII., he, in 1902, presented his Majesty with £200,000 for the foundation of a sanatorium for consumptives. In 1910 he set aside a similar sum for the purpose of creating a charitable organization for the benefit of indigent Englishmen seeking work in Germany, and of Germans, similarly circumstanced, seeking work in England. An enthusiastic sportsman, he owns many racehorses. He retired from active business in 1910.

**Cassell, JOHN** (1817-65), English publisher, and founder of the London firm of Cassell and Co., formerly Cassell, Petter, and Galpin, was born in Manchester. He

became in turn a temperance lecturer (1835), a clerk in London (1836), a tea and coffee merchant there (1847); but in 1850 began to devote himself to literature, issuing in turn the *Working Man's Friend* (1850), the *Illustrated Exhibitor* (1851), etc. Though these were moderately successful, it was not till he issued his *Popular Educator* (1852) and the *Family Paper* (1853) that he may really be said to have established a great business. After this he devoted himself principally to the issue of good literature at a cheap rate. See Frost's *Forty Years' Recollections* (1880).

**Cassia**, a botanical genus including several hundred species of herbs and trees belonging to the order Leguminosæ. They are mostly tender or half hardy in the climate of Britain, and therefore only succeed when grown under glass; but the annual partridge pea (*C. Chamæchrista*) and the perennial *C. marylandica* are hardy, and can be grown in any garden in a sheltered, sunny spot. The latter bears racemes of bright yellow flowers in late summer. The best known of the tender species is the S. American shrub *C. corymbosa*, which grows to a height of eight feet, and bears corymbs of yellow flowers in summer. *C. fistula*, *C. acutifolia*, and *C. elongata* are the source of the senna preparations used in medicine. *C. fistula*, from India and the W. Indies, yields black cylindrical pods about eighteen inches long. From these pods the *Cassia pulpa* of the British pharmacopœia is prepared. *C. elongata*, or *C. angustifolia*, is a native of India and Arabia, and its leaflets constitute the Tinnevelly senna, or *Senna indica*, of pharmacy. The leaflets of *C. acutifolia* constitute Alexandrian senna. The cassia of the Bible is the spicy bark of aromatic trees belonging to the genus *Cinnamomum*. The best



**Cassianus**

cassia bark comes from China, whence we also receive aromatic cassia buds. From the bark an oil is distilled which much resembles oil of cinnamon in scent, taste, and action.

**Cassianus**, JOANNES EREMITA, or JOANNES MASSILIENSIS (?360-448), a Scythian monk and theologian, who spent his early life in the monastery of Bethlehem with Germanus, afterwards visiting Egypt, Constantinople, where he was made a deacon (403) by Chrysostom, and Marseilles (415), where he established two religious societies, one the abbey of St. Victor. He was canonized after his death. Cassianus adopted some of the views of Pelagius, and opposed the extreme doctrines of St. Augustine and Prosper concerning original sin and human depravity. He left *Collations*, or conferences of the fathers of the desert; *Institutions*, in twelve books; and seven books on the Incarnation—all written in Latin, and first collected at Basel (1559). See edition by Gazæus (1616); *Historia Semipelagianismi* (1876); *Life* by Gibson (1895).

**Cassidaria**, a genus of gastropod molluscs whose members are found in the Mediterranean.

**Cassier's Magazine** was founded in 1891 by Mr. Louis Cassier, the present editor, and published in New York, as the first monthly publication devoted to purely engineering and scientific subjects. The illustrations are one of the features of this magazine. Among the contributors to *Cassier's* have been Lord Kelvin, Sir Hiram Maxim, Dr. Andrew Carnegie, Sir William White, Lord Charles Beresford, Sir J. Wolfe Barry, Sir J. Lowthian Bell, and Mr. Thomas A. Edison.

**Cassini**, a family of distinguished astronomers. GIOVANNI DOMENICO CASSINI (1625-1712), born at Perinaldo, near Nice, became professor of astronomy at

Bologna (1650). His discoveries relating to the planets Mars and Venus, also his settlement of the theory of Jupiter's satellites, increased his fame in France. Migrating to Paris (1669), on the invitation of Colbert, he was made astronomer-royal, and first director of the Paris observatory (1671-1711). His works include *Opera Astronomica* (1666), and *Origines et Progrès de l'Astronomie* (1693).—His son, JACQUES (1677-1756), born at Paris, succeeded to his father's appointments. He was made a member of the London Royal Society (1696), and became acquainted with Newton, Halley, and Flamsteed.—His son, CÉSAR FRANÇOIS, or CASSINI DE THURY (1714-84), devoted himself chiefly to geology. He published *Description Géométrique de la Terre* (1775), and *Description Géométrique de la France* (1784), but is best known by his topographical map of France, finished in 1793 by his son, JACQUES DOMINIQUE, Comte de Thury (1748-1845), who retired from astronomy in 1793, terminating the connection of his family with the observatory of Paris, after it had lasted one hundred and twenty-two years.—His son, ALEXANDRE HENRI GABRIEL, Vicomte de Cassini (1784-1832), was born at Paris, devoted himself chiefly to botany, and published principally in the collection *Opuscules Phytologiques* (1826).

**Cassino**, tn., prov. Caserta, Italy, nearly midway between Rome and Naples, 50 m. N.N.W. of the latter. It occupies the site of the ancient Casinum, which was colonized by the Romans in 312 B.C., and possesses remains of a Roman amphitheatre and other ancient buildings. All through the middle ages, and down to the year 1871, it was known as San Germano. Behind it, crowning a hill 1,700 ft. high, is the Benedictine monastery of



Monte Cassino, founded by St. Benedict in 529, and famed for its encouragement of learning. On the secularization of the Italian monasteries in 1866 it was declared to be a national monument, and now contains a theological seminary, as well as its own church (rich in marbles, frescoes, mosaics, and pictures), its extremely valuable library and archives, and a small picture gallery. Pop. (comm.) 14,000.

**Cassiodorus** (b. c. 480 A.D.), FLAVIUS MAGNUS AURELIUS CASSIODORUS, statesman and man of learning, was chief minister successively to Theodoric, Amalasontha, Athalaric, Theodatus, and Vitiges; but after the victories of Belisarius (about 540 A.D.) he returned to the monastery of Viviers in Bruttium, which he had founded. Here he collected a library, composed many works, invented mechanical contrivances, etc. There survive a collection of his own state papers, and a *Chronica* from the creation down to 519 A.D., with a very full list of the Roman consuls. See editions by Garet (1729) and Mommsen (1894).

**Cassiopeia**, an antique northern constellation adjacent to Cepheus. The Milky Way traverses it. Tycho Brahe's Nova blazed in its neighbourhood in November 1572.  $\alpha$  Cassiopeiae (*Schedir*) is slightly variable. Its spectrum is of solar type, and it is approaching the sun at the rate of 10 miles a second.  $\gamma$  is a spectroscopic binary;  $\Sigma$  3,062 is a visual binary, revolving in 105 years; and  $\psi$  is quadruple, being composed of two physically independent pairs of stars. R Cassiopeiae varies irregularly from 4.8-12 magnitude in 430 days.  $\eta$  Cassiopeiae is a fine binary, revolving in about five hundred years.

**Cassiques** (*Cassicinæ*), American passerine birds which construct large purselike or pocket-

like nests of grass or fibres. They belong to the family Icteridæ, which includes the so-called American orioles.

**Cassiquiare.** See ORINOCO.

**Cassiterides**, a group of islands from which the Phœnicians procured tin. They have been generally supposed to be the Scilly Isles, but have been identified also with the adjacent coast of Cornwall, and with the islands in Vigo Bay in Spain.

**Cassiterite**, TINSTONE, or BLACK TIN, is impure tin dioxide,  $\text{SnO}_2$ , the principal source of tin, and has been mined in Cornwall since the time of the Romans. It is black, or sometimes deep brown, in colour, and is often crystallized in tetragonal crystals, which have a brilliant lustre and great hardness. Its high sp. gr. (7) greatly facilitates the washing and sorting of tin ores. 'Stream tin' is cassiterite in rounded, waterworn grains or pebbles, found among the sand and gravel of streams. 'Wood tin' has a fibrous structure. Tinstone is associated usually with granite masses, and with the veins which these send out into the rocks around them. It has been of recent years extensively mined in Queensland, and in Bahia Blanca in Argentina, while the supplies from Cornwall have fallen off. Tourmaline frequently accompanies tinstone, and topaz and lithia micas are commonly found in tin-bearing granites.

**Cassius**, distinguished Roman clan. (1.) SPURIUS CASSIUS VISCCELLINUS, consul in 502, 493, and 486 B.C. He founded the greatness of Rome by making (493) the league with the Latin cities, and (486) that with the Hernicans. He is also said to have proposed the first agrarian law at Rome, and for that to have been accused of aiming at monarchy, and put to death by the patricians; according to some accounts, indeed, by his own father. (2.) CAIUS CAS-



SIUS LONGINUS, the murderer of Julius Cæsar. In 53 B.C. he distinguished himself as quæstor with Crassus in the Parthian war, and obtained victories in 52 and 51. He fought with Pompey in the civil war, but after the battle of Pharsalia surrendered to Cæsar, who not only pardoned him, but made him prætor in 44, with the promise of the government of Syria. Yet he instigated the conspiracy against Cæsar, and was the means of securing the help of Brutus. After Cæsar's death he went (43 B.C.) to Syria, defeated Dolabella, and after ravaging Syria and Asia, along with Brutus met Octavian and Antony at the battle of Philippi (42 B.C.). In the first engagement his troops were defeated, while Brutus was successful; and he compelled his freedman to slay him. He is well represented in Shakespeare's *Julius Cæsar*. (3.) CASSIUS PARMENSIS, so called from Parma, his birthplace, was also one of the murderers of Cæsar. After the battle of Philippi he joined Sextus Pompeius, then went over to Antony, and when the latter had been defeated at Actium, was put to death by Octavian (30 B.C.). He was a poet, and is commended by Horace. (4.) GAIUS CASSIUS LONGINUS, governor of Syria in 50 A.D., was banished by Nero (66), but was recalled by Vespasian. A learned and able jurist, he wrote ten books on the civil law, and reduced the theories of Ateius Capito to a more scientific shape. (5.) CASSIUS AVIDIUS, born in Syria, carried on war with success against the Parthians (162-165) as the lieutenant of Verus, and afterwards governed the eastern provinces with ability; but in 175 A.D., at the instigation of Faustina, he rebelled against Aurelius. His own officers slew him before Aurelius reached Syria.

**Cassivelaunus**, a British prince who ruled the country

north of the Thames, and led the national resistance to Cæsar's first invasion in 54 B.C. He was defeated, and obtained peace by becoming tributary to Rome. See Cæsar's *De Bello Gallico*, lib. v. *passim*.

**Cassock** (Ital. *casacca*), originally a long military horseman's cloak, but latterly restricted to a garment worn by clergymen or other ecclesiastical functionaries. The cassock of the Roman Catholic priests must always be worn whenever they appear in public, and varies according to the rank of the wearer. The cassock of the Church of England clergyman is a long, black, close-fitting frock, worn under the surplice, and also sometimes as an outdoor garb, in the manner of the soutane of Catholic priests. In England, vergers and choristers sometimes wear cassocks.

**Cassowary** (*Casuaris*), one of the five living kinds of running birds, confined to Australia, New Guinea, and the adjacent islands. They are somewhat smaller than the allied emus, and differ markedly from them in the presence of a bony helmet on the head, and usually wattles on the naked neck. The glossy, hairlike plumage is black; and the cock—which, as usual among running birds, incubates and takes care of the young—is smaller than the hen. The birds inhabit wooded country, often the dense scrub, and are naturally shy, though old males are fierce when brought to bay. The eggs are from three to six in number, and are of large size.

**Cast.** See CASTING.

**Castaldi**, PAMFILO (1398-1490), Italian humanist and poet, born at Feltre in Lombardy. He founded there a school in which he taught literature and the Italian language, its great reputation attracting many foreigners. Italian writers (e.g. Bernardi) claim that Castaldi is the real inventor



of movable types, and therefore of printing; and that the secret was carried to Gutenberg by Johann Fust or Faust, who is alleged to have been one of Castaldi's pupils and intimates. It is also stated that Galeazzo Sforza granted Castaldi the privilege of establishing a press at Milan in 1472. See Bernardi's *P. Castaldi ed'Invenzione dei Caratteri Mobili per la Stampa* (1865), and Fumagalli's *La Questione di P. Castaldi* (1891).

**Castalia**, a spring on Mount Parnassus, near Delphi, held to be frequented by Apollo and the Muses, and thus a fount of poetical inspiration.

**Castamouni**. See KASTAMUNI.

**Castanet**, a simple clapper instrument, consisting of two small concave pieces of hard wood or ivory, shaped somewhat like the capsule of a chestnut slit through the middle. The pieces are fastened together by a cord, which is slipped over the thumb of the performer, who strikes the two halves together with his fingers. Usually the player has a pair of castanets in each hand. The instrument is of Spanish origin, and it is still largely used by the Spaniards and Moors as an accompaniment to their dances and guitars. The crotalum of the ancients resembled the castanet.

**Castaños**, DON FRANCISCO XAVER, DUKE OF BAILÉN (1756-1852), Spanish commander, born in Vizcaya. During the Peninsular war he co-operated with Wellington, and rendered complete the successes of Albuera, Salamanca, and Vitoria. He received his ducal title in consequence of the victory he won over General Dupont de l'Étang at Bailen (1808).

**Caste**. In India, class distinction, or caste—much more pronounced and rigid than ours—is entirely an accident of birth. In whatever caste a man is born, in

that caste he continues. Caste is the offspring of Brahmanism, and the Brahman is the central feature of its system; all others acknowledge him as lord. The origin of this marvellous institution, which, established more than three thousand years ago, still maintains its hold over the Hindu race, probably grew at first out of racial distinctions, when the earliest Aryan immigrants into India settled among the aborigines. Accordingly the pure Aryan, issuing from the Creator's mouth, was the Brahman. Next came the Kshatriya, or caste of fighting men, who were appropriately alleged to have sprung from Brahma's arms. From this caste princes and rulers were selected to govern under the counsel of the Brahman.

Vegetarian communities recognize the importance of the agriculturist, so the Vaisya—the issue of the Creator's loins—ranks third in the social scale. The degraded Sudra was the offspring of Brahma's feet. The consequent developments were so varied that it is now impossible, within a limited space, to give an exhaustive list of the endless divisions and subdivisions of the four original castes.

One of the most important 'caste prejudices' has reference to food. Members of different castes may neither eat nor drink together, and no one may partake of a dish prepared by one of lower caste than himself. Most Hindus are vegetarians; to all the cow is a sacred animal. To a Hindu loss of caste means not merely social ostracism, but exclusion from religious rights, and exclusion from sanctuaries: and few Europeans can conceive the horror with which many Hindus regard the consumption of animal flesh; and when flesh-eating leads to the sacrifice of the sacred cow, the disgust



and abhorrence of the high-caste Brahman are beyond expression.

In a climate in which the pulses are deadened to activity, and the tendency is in the direction of voluptuous languor, caste has taught repression and self-control. High barriers against indiscriminate intermarriage have preserved purity of blood and intellectual ability; encouragement of hereditary trade and pursuits has led to the creation of experts. Caste is not dead. It still appeals to the people, and, whether for good or evil, it is a potent factor in British dealings with the Hindu subjects of the Indian empire. See Rev. M. A. Sherring's *Hindu Tribes and Castes* (1872-81), and Sevort's *Les Castes dans l'Inde* (1896).

**Castelar, EMILIO** (1832-99), Spanish statesman, orator, and author, born at Cadiz; educated at Madrid University, where he afterwards occupied the chair of history and philosophy (1856). Devoting himself to politics while still young, he soon acquired great influence by his eloquence, and was frequently persecuted by the government for liberal sympathies. In the university he delivered a series of lectures on '*La Civilizacion en los Cinco Primeros Siglos del Cristianismo*' (2nd ed. 1865), and wrote a sketch of democratic principles entitled *La Formula del Progreso*. Founding (1864) *La Democracia*, he wrote with caustic bitterness against the government, and was removed (1865) from his professorship. Condemned to death after the attempted insurrection in 1866, he escaped to Paris, but returned to Spain in 1868. His advanced views were fully expounded in *Cuestiones Politicas y Sociales*, published in 1870, which was followed in 1871 by *Discursos Parlamentarios*. He largely assisted in the downfall of King Amadeus (1873), and in September of that

year was appointed dictator by the Cortes, but resigned (1874). In addition to the works already mentioned, Castelar wrote a *Historia del Movimiento Republicano en Europa* (2 vols. 1872-4), *La Cuestion de Oriente* (1876), a pamphlet against Cæsarism, and many minor works. See *Emilio Castelar*, by Sanchez del Real (1873); *Don Emilio Castelar*, by David Hannay (1895); and Gonzalez Araco's *Castelar* (1900).

**Castelbuono**, tn., prov. Palermo, Sicily, 6 m. by rail s.s.e. of Cefalu; with mineral springs. Pop. (comm.) 11,000.

**Castelfidardo**, comm., Italy, in the Marches, 10 m. s. of Ancona. Here in 1860 the forces of Victor Emmanuel defeated the papal army. Pop. 7,000.

**Castelfiorentino**, tn., Tuscany, Italy, 20 m. s.w. of Florence, with glass and pottery manufactures. Pop. (comm.) 11,000.

**Castelfranco**. (1.) Town and episc. see, Venetia, Italy, in prov. of and 15 m. w. of Treviso. It is still in part surrounded by its ancient walls, and in its cathedral is a Madonna, the greatest of the works of Giorgione, who was a native. Here the French defeated the Austrians in 1805. Pop. 13,000. (2.) Town, Italy, 7 m. s.e. of Modena; engaged in silk trade and match and paper making. Pop. (comm.) 14,000.

**Castel Gandolfo**, tn., prov. Rome, Italy, 14 m. s.e. of Rome, on the left shore of Lake Albano. Has a papal summer palace, built by Urban VIII. in the 17th century; also noblemen's seats. Pop. 2,300.

**Castellammare**. (1.) Town, Sicily, on the N. coast, 45 m. by rail w.s.w. of Palermo; has tunny and anchovy fisheries, and trade in wine, olive oil, and corn. Pop. 20,000. (2.) C. DI STABIA, tn. and episc. see, Italy, on Bay of Naples, 17 m. by rail s.e. of Naples; was founded on the ruins



of the ancient Stabiæ, which perished at the same time (79 A.D.) as Pompeii. It is visited for sea-bathing, its sulphur baths, and its mineral springs. The people manufacture macaroni, cotton, soap, needles, etc., and prosecute fishing and shipbuilding. There is a former royal villa (Quisisana), now a hotel, an arsenal, and ruins of a castle built by the Emperor Frederick II. Pop. 33,000.

**Castellammare Adriatico**, comm., Abruzzi e Molise, Italy, in prov. Teramo, and 9 m. N. of Chieti. Pop. 9,000.

**Castellamonte**, tn., Piedmont, Italy, 22 m. N. of Turin. Pop. (comm.) 6,000.

**Castellana**, tn., Italy, in Apulia, prov. of and 22 m. S.E. of Bari. Pop. 11,000.

**Castellaneta**, tn. and episc. see of Italy, 24 m. by rail N.W. of Taranto. Pop. 10,000.

**Castellanos**, JUAN DE (c. 1510-90), Spanish poet, born at Tunja, best known as the author of *Elegias de Varones Ilustres de Indias* (1589), a rhyming chronicle of his experiences in America.

**Castellazzo**, tn., Piedmont, Italy, prov. of and 6 m. S.W. of Alessandria. Pop. 7,000.

**Castelleone**, vil., Lombardy, Italy, prov. of and 18 m. N.W. of Cremona. Pop. (comm.) 8,000.

**Castello**, SEBASTIANO (1515-63), theologian, born in Savoy, and served for three years as a teacher in the college of Geneva (1540), but differing from Calvin, removed to Basel (1544), where he was appointed professor of Greek (1553), and where he died. His chief works were elegant translations of the Bible into Latin and French. See *Lives* by Mähly (1862) and Buisson (1892).

**Castello Branco**, tn. and episc. see, Portugal, prov. Beira, 45 m. N.E. of Abrantes. The neighbourhood is rich in Roman remains. Woollens, wine, and spirits are manufactured. Pop. 7,000.

**Castello-Branco**, CAMILLO, VISCOUNT OF CORREIA-BOTELHO (1826-90), Portuguese author, born at Lisbon, the most popular and the most national of modern Portuguese writers. Among his numerous works are *Um Livro* (1858), a volume of poetry; *Amor de Perdição* (1862); *Amor de Salvação* (1864); *Onde Está a Felicidade* (1857); *Scenas Contemporaneas* (1862); *Os Brilhantes do Brasileiro* (1869); *Maria da Fonte* (1885) — novels of a historical or social character. He also wrote several plays and literary studies. See Pimentel's *O Romance de um Romancista* (1890-2).

**Castello de Vide**, tn., prov. Alemtejo, Portugal, 12 m. N.W. of Portalegre, at the N. end of the Serra de São Mamede; manufactures cloth. Pop. 5,000.

**Castellón**. (1.) Province, Valencia, Spain; area, 2,495 sq. m.; on the Mediterranean coast. Extremely mountainous, except a plain between the range and the sea. Fisheries very productive, and, with fruit-growing for export, form the principal wealth of the province. Some silver, lead, and cinnabar mines in Espadan range are worked actively, and there are factories of scarfs, mantas, saddle-bags of semi-Moorish taste. Pop. 310,000. (2.) C. DE LA PLANA, cap. of above prov. Fortress, 2 m. from Mediterranean, on railway from Valencia to Tarragona. A busy, prosperous place, manufacturing flax goods of all sorts. Great centre for export of oranges, wine, etc. Pop. 30,000.

**Castelnaudary** (anc. *Castrum Novum Arianorum*), tn., dep. Aude, France, 22 m. N.N.W. of Carcassonne, at the highest point of the Canal du Midi (320 ft.). It has textile manufactures, flour mills, distilleries, earthenware works, foundries, etc. Pop. 9,400.



**Castelnuovo**, fort. seapt. of Austria-Hungary, in Dalmatia, 25 m. s.e. of Ragusa. It has a Greek monastery. Pop. (comm.) 8,500.

**Castelnuovo Berardenga**, comm., Tuscany, Italy, prov. of and 10 m. e. by n. of Siena. Vine-growing centre. Pop. 8,000.

**Castelnuovo Scrivia**, tn., Piedmont, Italy, prov. of and 15 m. e. by n. of Alessandria. Pop. 7,500.

**Castel San Giovanni**, tn., Emilia, Italy, on the Po, prov. of and 13 m. w. of Piacenza. Pop. (comm.) 9,500.

**Castel San Pietro**, tn., prov. Bologna, Italy, 15 m. by rail s.e. of Bologna. Pop. 14,000.

**Castel Sarrasin**, tn., dep. Tarn-et-Garonne, France, 12 m. w.n.w. of Montauban, on r. bk. of Garonne. Pop. 7,500.

**Casteltermini**, tn., prov. Girgenti, Italy, 16 m. n. of Girgenti; has trade in rock-salt and sulphur. Pop. 13,000.

**Castelvetrano**, tn., Sicily, prov. Trapani, 27 m. by rail e.s.e. of Marsala; stands in a fertile plain which produces wine, olives, cotton, silk, and flax. A few miles to the s., near the coast, are the ruins of the ancient Selinus. Pop. 25,000.

**Casti**, GIAMBATTISTA (1721-1803), Italian poet, born at Prato; studied at the seminary of Montefiascone. Entering the service of the Emperor Joseph II., he was attached to embassies at St. Petersburg, Berlin, and other cities. Eventually the emperor made him his court poet. Having fallen into disgrace after his patron's death, he retired to Florence, and then to Paris (1798), where he died. A complete edition of Casti's works appeared at Paris in 1838. His chief works are *Poema Tartaro* (1803), a satire on the Russian court; *Gli Animali Parlanti* (1802; Eng. trans. 1816 and 1819); *I Tre Giulj* (1762; Eng.

version by M. Montagu, with a memoir of the author, 1826; another ed., *The Three Goats*, 1841). While at Vienna, Casti wrote excellent *libretti* for Paisiello and Salieri (*La Grotta di Trofonio*, *Il Re Teodoro in Venezia*).

**Castiglione**. (1.) Town, Sicily, prov. of and 25 m. n. of Catania, at the n.e. foot (2,040 ft.) of Mt. Etna; famous for its hazel nuts. Pop. 13,000. (2.) C. DELLE STIVIERE, tn. near Lake Garda in Lombardy, Italy, 22 m. n.w. of Mantua. It is noted as the scene of the victory of the French over the Austrians in 1796. Pop. 6,000.

**Castiglione**, tn., Umbria, Italy, on Lake Trasimeno, 20 m. w. of Perugia. Pop. 14,000.

**Castiglione Fiorentino**, comm., Tuscany, Italy, prov. of and 10 m. s. by e. of Arezzo; has silk industries. Pop. 14,000.

**Castiglione**, BALDASSARE, COUNT (1478-1529), Italian writer, born at Casanatico; entered the service, successively, of several Italian rulers, including Duke Lodovico Sforza (il Moro) and Pope Clement VII., for whom he went to Spain in 1525 as papal nuncio. He died at Toledo, a man of brilliant gifts, who had seen life intimately at the courts of Mantua, Urbino, Rome and Spain, England and France. Accordingly his picture of the 'perfect courtier' of his time is a notable work. The *Cortegiano* (1528; best modern ed. is that of Cian, 1894) is in the form of conversations held between ladies and gentlemen in the palace of Urbino. The style is refined and elegant, and as a contribution to the history of civilization the book is invaluable. English versions have been made by Hoby (1561; twice reprinted in 1900) and by Opdycke (1901). See *Lives*, etc., by Marliani (Introduction to the *Opere*, 1733), by Serassi (Introduction to the *Cortegiano*, 1766), by Martinati (1890).



and by C. Bufardecì (1900); also *B. Castiglione, the Perfect Courtier*, by Julia Cartwright (1908).

**Castiglione**, CARLO OTTAVIO, COUNT (1784-1849), Italian philologist, born at Milan; established his reputation by the *Mémoire Géographique et Numismatique sur la Partie Orientale de la Barbarie* (1826), wherein he attempts to reveal the history of those towns in Barbary whose names are preserved on Arabic coins. With Cardinal Mai he published the Gothic version of the Old and New Testaments by Ulfilas (1819). See *Life* by Biondelli (1856).

**Castile**, or CASTILLE, a former kingdom of Spain, divided into Old Castile and New Castile, and occupying the central plateau of the peninsula. This great plateau region, with an average elevation of about 2,500 ft., having intensely hot summers and rigid winters, is partly cultivable or affording pasture, partly sterile, and is traversed or bordered by ranges of mountains reaching elevations of 6,000 to 8,000 ft. Old Castile, with an area of 25,372 sq. m., was in 1833 divided into the provinces of Valladolid, Palencia, Burgos, Santander, Logroño, Segovia, Soria, and Avila; New Castile (area, 27,935 sq. m.) into Toledo, Madrid, Guadalajara, Cuenca, Ciudad Real. Castile formed in the 8th century part of Leon, but in 923 became practically independent, and a hundred and ten years later received its first king in the person of Ferdinand I., son of Sancho the Great of Navarre. Ferdinand extended his dominion over Leon, Asturias, Galicia, etc., but on his death there was a division of his territories among his three sons. Alfonso VI. (d. 1109) reunited the kingdom in 1072, and Ferdinand III. (d. 1252), by capturing Cordova, Seville, and Cadiz from the Moors, further enlarged and consolidated it.

In 1465 Isabella became queen of Castile, and four years later married Ferdinand, king of Aragon. After 1480 the history of Castile merges in that of Spain. The Castilians are distinguished by a haughty gravity of demeanour. Their dialect is the official language of Spain; and Madrid, standing between the two Castiles, became under Philip II. the capital of the whole country.

**Castilho**, ANTONIO FELICIANO, VICOMTE DE (1800-75), Portuguese poet, born at Lisbon. Although he lost his sight at the age of six years, he became celebrated very young through his bucolic collection, *Cartas de Echo e Narciso* (1821). In 1819 King John VI. gave him a lucrative sinecure at Coimbra, but he lost this in the revolution of 1845, and was forced to emigrate to the Azores until 1863. His poetical works, of an elegiac character, are marked by great delicacy of feeling and by a masterly harmony of language. Those include *Amor e Melancolia* (1828), *A Noite do Castello* (1836), *A Primavera* (2nd ed. 1837), and *O Outono* (1863). He also translated Ovid's *Metamorphoses* (1841) and *Fasti* (1859) and Virgil's *Georgica* (1865). He adapted with success several of Molière's comedies, Goethe's *Faust*, and Shakespeare's *Midsummer Night's Dream*. See Julio de Castilho's (his son) *Memorias de Castilho* (1881).

**Castillejo**, CRISTÓVAL DE (1490-1556), Spanish poet, born at Ciudad Rodrigo. He was one of the last representatives of the old Spanish school, and fought against the classical-Italian forms of literature which were then being introduced into Spain. His compositions, mostly of a satirical character, exhibit great versatility of form and of language, and true poetic inspiration. Many of them were circulated in MS. only, for fear of the



Inquisition. The first complete edition of his works is that in the 32nd volume of the *Biblioteca de Autores Españoles* (1854). Among other works are *Diálogo de las Condiciones de las Mujeres*, a powerful satire on women; *Sermon de Amor*; and *Historia de Piramo y Tisbe*.

**Castillo de Locubin**, tn., Andalusia, Spain, prov. of and 20 m. s.w. of Jaen. Pop. 6,300.

**Castillon**, tn., dep. Gironde, France, on the Dordogne, 25 m. by rail E. of Bordeaux. In 1453, the English were here defeated by the French and their leader, John Talbot, Earl of Shrewsbury, slain. (See Shakespeare's *King Henry VI.*, part i.). Montaigne died here. Pop. 3,000.

**Casting** is (1) a process, and (2) its product.

(1) Casting is the *process* of pouring melted metal or other fusible substance into moulds, where it cools and hardens into the shape of the mould. By a natural extension, the term is applied equally to pouring into moulds a substance rendered temporarily liquid in any other way, as by mixing with water (cement, plaster of Paris), or by dissolving (gelatine, sugar).

Casting of metals is so widely employed in the industrial arts that the word casting without other qualification refers to metal. A large part of the iron, brass, and type-making industries depends on casting. Glass, wax, and similar fusible substances are often cast. Slag and analogous melted minerals are sometimes cast to form bricks and the like.

The details of the casting process vary with the melting temperature of the substance, its physical and chemical affinities for other substances when melted, and the nature of available mould materials. The kind of mould that can be used is an essential

factor. In the case of iron and brass, the preparation of the moulds is the most important part of the art of founding, to which casting belongs (see IRON FOUNDED). Sand containing a small percentage of clay or loam is used for most moulds for iron and brass, being made slightly damp so as to hold the impress of the pattern and resist the pressure of the molten metal. Some sand moulds are baked, and those parts of moulds which serve to 'core' out interior hollows in the shape desired are nearly always baked (cores). Loam moulds are used for certain purposes, being baked before casting. In a few cases iron is cast in iron or part-iron moulds, usually to obtain a hard chilled surface, but recently (1909), by a newly developed process, for soft iron castings also (the method being to remove the castings from the mould when barely solidified, and letting cool slowly, to 'anneal' the iron). Moulds for other materials vary according to the substance being cast, chiefly according to the melting temperature and to the desired surface finish. Brasses and bronzes are often cast in iron moulds, especially when required to be forged or rolled into rod. Most metals, except iron or steel, are cast in iron moulds when required in ingot form.

Casting without moulds is practised only in rare instances, as in making shot by allowing melted lead to go through a screen, from which the drops can fall far enough to harden. 'Squirting' the dissolved cellulose for incandescent-lamp filaments is an analogous process.

Sometimes casting serves to join two pieces. Wrought-iron or steel rods are sometimes embedded in a casting by setting them in the mould to project part way into the hollow of the



mould. Joining of two pieces by casting is also done in setting anchor bolts or railing posts into a stone base, when melted sulphur or lead is run into the hole around the bolt or post.

Casting iron is the most difficult of casting processes, and its troubles are typical of those inherent in casting. The high temperature of the melted iron restricts the choice of mould substances, as noted. In melting the metal, contamination by the fuel and gases takes place, and the ready oxidation of iron by air causes a certain loss of iron. The iron that is tapped from the furnace not only contains some entrained and dissolved gases, which must separate out in either ladle or mould if the casting is to be sound, but also by its heat generates steam and gases from the material of the mould. These must be allowed to pass out of the mould freely (outward through the sand, where they burn when reaching the air), or they will burst the mould, or at best make the resulting piece porous and useless. When the actual casting has been successfully accomplished, the hot piece must cool slowly and uniformly; if one part solidifies long before the rest of the piece, the uneven distribution of contraction during cooling will warp the piece out of shape or will give rise to dangerous stresses in the finished piece. Annealing—i.e. reheating the cooled piece to red heat and allowing it to cool very slowly in the oven, is a means of removing such stresses, but on account of its additional cost is seldom employed.

(2) Casting denotes also the product of the process, or the piece cast. Ordinarily, it means a piece of iron (cast iron) the shape of which is produced by moulding and pouring. As nearly every machine is in the main an aggregation of castings, the qual-

ities of iron castings are influential in determining machine design.

Castings are rather rough of surface; have a hard skin, due to contact and partial fusion with the sand of the mould; are not precisely true to form; are rather brittle, and not flexible, or ductile; are weak against tensile stresses; are apt to be non-homogeneous, and may have unknown shrinkage strains in their interior. Gas bubbles or porous spots frequently occur in them. Some of these characteristics are due to the chemical composition of the metal required for easy melting. Cast iron contains about 3 per cent. carbon, partly in combined and partly in free or graphitic form;  $\frac{1}{2}$  to 1 per cent. silicon, and other impurities. Steel and wrought iron, having generally much lower impurities, are harder to melt, and would be fatally contaminated by direct contact with the melting fuel. Other characteristics noted are due to the casting process itself.

Where castings must fit given dimensions exactly, they have to be dressed (by turning, planing, chipping, filing, etc.). For fastening together different castings by smaller joining-pieces (bolts, pins, etc.), steel must be used to obtain the necessary strength. As a consequence, also, of the brittleness of castings, riveting is never employed to join them. Broadly speaking, on account of the low strength and distinct brittleness of cast iron, a casting must have three or four times the cross-section of an equivalent forged or rolled-steel piece. However, the great ease of forming any desired shape by the casting process makes castings absolutely essential; and since most machinery requires to be relatively massive, in order to absorb vibrations and give rigidity, it usually happens that the dimensions necessi-



tated by this requirement are ample for strength.

*Steel Castings* have come into considerable use, of recent years, for those purposes wherein great strength and absence of brittleness are demanded. The steel is melted in an open-hearth gas furnace, such as is used for making steel, and is poured into sand moulds in the same way as cast iron. Steel castings are usually annealed, to make them soft and ductile, and get rid of shrinkage strains.

The design of both iron and steel castings is chiefly fixed by the matter of shrinkage strains. It is found highly desirable to make the thickness of metal as nearly uniform throughout a casting as possible, so that the rate of cooling after pouring may be uniform. Sharp re-entrant angles are to be avoided, where possible, because incipient cracks may be found in such corners. Thus, castings should be given well-rounded contours, filleted angles and corners, and webbed or box-shaped sections to secure the required strength without local massing of metal. The cross-sections are to be so proportioned as mainly to experience compressive stresses. A primary object, also, is to minimize the amount of dressing or 'machining' needed for securing accurate and smooth contact surfaces.

**Casting Vote.** See CHAIRMAN.

**Cast Iron.** See IRON.

**Castle,** a term denoting a stronghold. Among Irish antiquaries, *caiseal* (pron. *cashel*) is restricted to a certain kind of walled enclosure of considerable extent, having rooms within its walls, which are of great breadth. In Great Britain, again, the word has been applied to forts surrounded by ramparts of earth, or stone, or vitrified stone; to palisaded forts, to the 'peels' of the Anglo-

Scottish Borders and other towers of the same description, to brochs, and to large feudal castles. These last two instances, however, are linked together, according to Sir Walter Scott, by the keep, which he maintains to be an elaboration of the more primitive broch. (See Note I. to *Ivanhoe*, and compare with plans of brochs the descriptions of the keeps of Conisborough and Barnard Castle in G. T. Clark's *Mediæval Military Architecture in England* (1884), vol. I. pp. 207-210, and 431-453.) In other countries castles have also presented a great variety of forms. In Palestine, for example, the ruins of no less than four different kinds of castles have been found in one place—at Ta'anuk or T'ana, near Jaffa. Of these, the oldest, supposed to be Canaanite, is of unhewn stone, two are Israelite of different periods, and the latest is Arabian. The Arabian castles are of great interest from the fact that Arab influence is very perceptible in European mediæval castles. Even to-day, as Mr. Theodore Bent discovered, the castles of the Hadramaut bear a distinct resemblance to those of Europe during the middle ages. This resemblance is due not to Arab conquest in S. Europe, but to the long residence of Europeans in Syria during the crusades. The crusaders' castles in Syria were themselves of the highest interest. Of Reginald of Châtillon's castle of Kerak, near the south-east coast of the Dead Sea, it is stated that the massive walls rose to a height of 100 ft., and were in one place 27 ft. thick. Like its Eastern congeners, it displayed the features of concentric defence—an idea not properly understood by European architects prior to the crusades. This style of fortress attained its full development in England, under



the direction of Edward I., although it had actually been introduced before his time; and the ruins of the castles of Conway, Carnarvon, Beaumaris, and Harlech, all in Wales, still testify to his skill. The chief characteristic of this style of defence is that an attacking force can find no spot, all along the walls, where it is free from the fire of the besieged. And further, even when the outer works have been taken, the besiegers find themselves confronted by a second and a third line of defence. The whole fortification was surrounded by a wide and deep moat—where possible, full of water. The only access to the gateway was by a drawbridge, itself protected by an outwork called a barbican. This taken, the besiegers found themselves before a portcullised gateway, behind which were heavy doors studded with iron. On either side were strong towers commanding the gateway, and above was a projecting 'machicolation,' from which molten lead, scalding water, or great weights were dropped upon the besiegers. The whole line of the outer wall was protected by bastions at every fifty yards, and bastions and walls were alike crenellated. And even if the gateway were forced or the adjoining ramparts scaled, the attacking force only found itself in the large open area called the 'outer bailey,' exposed to a heavy fire from the walls and battlemented roof of the keep, and from the gateway of the 'inner bailey.'

Within the enclosure last named were the barracks, the hospital, and the chapel. The great dining-hall was in the keep, the upper stories of which formed the residence of the nobleman or governor. The walls of the hall were hung with tapestry, or ornamented with scenes painted in distemper on the plastered walls and

ceiling. Banners, standards, and armorial bearings, interspersed with arms and armour, further decorated the walls. The floor, of pavement or of enamelled tiles, was strewn with rushes, scented herbs, or straw, renewed daily. A long oaken table stood in the middle of the hall, with benches on either side, and at the upper end was a silken-canopied chair of state for the lord. A wooden gallery for the musicians, placed half-way up the wall, occupied one end or corner of the hall.

After the 13th century a greater degree of luxury began to prevail in these castles, and in later centuries they imperceptibly ceased to be strongholds, their defensive features being refined away. See Clark's work already cited; M'Gibbon and Ross's *Castellated and Domestic Architecture of Scotland* (1887-92); Viollet le Duc's *Dictionnaire de l'Architecture Française* (1858-68); and Mackenzie's *Castles of England* (1897).

**Castlebar**, a mrkt. and assize tn., cap. of Co. Mayo, Ireland, 10 m. by rail E.N.E. of Westport. It was taken by the French, who landed at Killala Bay in 1798, and held the place for a fortnight. Pop. 3,600.

**Castlecomer**, par. and mrkt. tn., N. Co. Kilkenny, Ireland, 5 m. E. of Ballragget. Coal is worked, Pop. 5,200.

**Castle Donington**, a tn. and par. in Leicestershire, England, close to the river Trent, 9 m. S.E. of Derby. Ac. 3,840. Pop. 2,500.

**Castle Douglas**, tn., Kirkcubrightshire, Scotland, on Loch Carlingwark, 16 m. S.W. of Dumfries. Pop. 3,000.

**Castleford**, tn., W. Riding of Yorkshire, England, on the Aire, 9 m. S.E. of Leeds. A centre for coal and the manufacture of glass bottles, earthenware, and chemicals. Pop. 18,000.

**Castle Garden**, a round fort on the Battery, New York, S. of



Manhattan I., U.S.A.; originally called Fort Clinton. From 1855 to 1890 immigrants for the States were received and examined here, but that work is now done on Ellis I., New York harbour. Castle Garden is now used as an aquarium.

**Castleisland**, par. and tn., E. Co. Kerry, Ireland, on riv. Maine, 12 m. s.e. of Tralee. Pop. 5,300.

**Castleknock**, par. and vil., Ireland, on the Liffey, in co. of and 5 m. n.w. of Dublin. The vice-regal lodge and the residence of the under-secretary for Ireland are in this par. Pop. 5,000.

**Castle Mail Packets Company, Limited.** See UNION-CASTLE STEAMSHIP LINE.

**Castlemaine**, tn., co. of Talbot, 78 m. by rail n.n.w. of Melbourne, Victoria, Australia. The district is mining and agricultural, and Brest Creek is celebrated as being the second locality in Victoria at which gold was found. Pop. 6,000.

**Castlemaine**, BARBARA VILLIERS, COUNTESS OF CASTLEMAINE and DUCHESS OF CLEVELAND (1641-1709), daughter of Wm. Villiers, second Viscount Grandison. She married Roger Palmer (1659), created Baron Limerick and Earl of Castlemaine (1661). Her intimacy with Charles II. seems to have commenced a year later, and continued in the most open and flagrant manner till 1673. During this period her influence with the king was paramount, and she was instrumental in securing the dismissal of Clarendon. She was created Baroness Nonsuch, Countess of Southampton, and Duchess of Cleveland (1670). Barbara Villiers spent the latter years of her life at Chiswick. She is unanimously described as a 'beautiful termagant,' avaricious, but recklessly extravagant. Her children by Charles II. were Anne, Countess of Sussex (1661); Charles, Duke of Southampton (1662); Henry, Duke of Grafton (1663);

Charlotte, Countess of Lichfield (1664); and George, Duke of Northumberland (1665). See *Memoirs of Barbara, Duchess of Cleveland*, by G. S. Steinmann (1871-8).

**Castlereagh**, ROBERT STEWART, VISCOUNT, SECOND MARQUESS OF LONDONDERRY (1769-1822), second son of the first Marquis of Londonderry. He became a Tory in 1795, and in consequence was appointed (1797) keeper of the Privy Seal. He adhered at first to Catholic emancipation, but nevertheless laboured assiduously with Pitt for the Act of Union. After that measure had been secured Castlereagh was appointed president of the Board of Control (1801) in Addington's ministry, but in January 1805 became war minister under Pitt, and afterwards held the same office in the Portland cabinet until September 1806. The vigorous character of his policy was shown in the bombardment of Copenhagen and in the Peninsular war; but the abortive Walcheren expedition (1809) led to serious differences between him and Canning. A duel ensued between them on Putney Heath, when Canning was slightly wounded. As foreign secretary under Lord Liverpool in 1812 Castlereagh became the moving spirit of the coalition against Napoleon, and the spirited campaigns of 1813-14 were practically due to him. He was England's representative at the Congresses of Chatillon and Vienna (1814-15), Paris (1815), and Aix-la-Chapelle (1818). At this period he incurred much odium at home in consequence of the drastic domestic measures of the government. He was held responsible for the 'Peterloo massacre' and the arbitrary 'Six Acts,' and also for the prosecution of Queen Caroline; was pilloried as the creature of Metternich and the agent of the Holy Alliance. The weight of public anxieties, com-



bined with his grief over the severance of England from her old allies, unhinged his reason, and he committed suicide at his seat, North Cray Place, in Kent. Though he was of statesmen the most detested of his time by the populace, it was largely to him that England was indebted for the long years of peace which followed the overthrow of Napoleon. An excellent diplomatist, he had undoubted courage and judgment; but it is not surprising that his contempt for ordinary popularity and the harsh measures he thought necessary made his name a byword. See Sir A. Alison's *Lives of Lord Castlereagh and Charles Stewart* (1861), and *Correspondence and Dispatches of Lord Castlereagh*, edited by his brother, C. W. Vane (12 vols. 1848-53). See also *Life* by Lady Londonderry (1904), and Lord Salisbury's *Essays* (1905).

**Castleton.** (1.) Parish and vil. in High Peak div. of Derbyshire, England, 9 m. N.E. of Buxton. The ruin of the Castle of the Peak, built by William Peveril, natural son of William the Conqueror (see Scott's *Peveril of the Peak*), stands on a neighbouring height. Castleton has interesting caves, and mines yielding fluor spar. Pop. 500. (2.) C. OF BRAEMAR. See BRAEMAR.

**Castletown** (anc. *Rushen*), seapt. on bay of same name, at s. end of Isle of Man, 11 m. S.W. of Douglas. It was the capital of the island during the time of the Welsh princes. Its castle, Rushen, dates from the 6th century, and was to the end of the 18th century the usual residence of the governor of the island; it is now used as a prison. The House of Keys met here for nearly two hundred years. King William's College, 1 m. to N.E., founded 1830, is the chief public school of the island. Exports fish, lead and copper ore, etc. Pop. 2,000.

**Castor**, or CASTOREUM, consists of the dried preputial follicles of the beaver. In the fresh state the glands contain a yellowish creamy substance, which when dried becomes dark in colour. The brown resinous secretion contains a crystalline substance termed castorin, besides salicin (obtained from the willow bark which the animal gnaws), benzoic acid, phenol, and a volatile oil. These glands were formerly cut up and macerated in spirit to form a tincture which was used as a stimulant and antispasmodic.

**Castor** =  $\alpha$  Geminorum, a bright northern star (photometric magnitude 1.6). With a third-magnitude companion it makes a stately couple, in slow revolution, in a period of over 300 years, first measured by Bradley in 1719. Both components are spectroscopic binaries, the period of the brighter pair being 9.2 days and of the smaller 3 days. The spectrum is of the Sirian type, and the parallax of 0".2 indicates a distance of 16 light years. It is approaching the sun at the rate of 18 m. a second.

**Castor and Pollux** (Gr. Polydeuces), the Dioscuri or 'sons of Zeus,' were, according to Homer, sons of Tyndarus and Leda, and brothers of Helen and Clytæmnestra. Castor was famous for his horsemanship, Pollux for his boxing; both died before the siege of Troy, but were permitted to enjoy immortality, though only on alternate days. Later stories call Zeus their father; he visited Leda in the form of a swan, and she brought forth two eggs, from one of which Castor and Pollux were born, and from the other Helen and Clytæmnestra. They were worshipped at Sparta, and thence through Greece and Italy, and were regarded as the protectors of sailors. Their worship was introduced in Rome at an early date, and it was said to be



owing to their assistance that the Latins were defeated in the battle of Lake Regillus. The Roman knights revered them as their patrons. In more modern times they gave title to an opera by Rameau (1737); and Rubens's fine picture of *Castor and Pollux carrying off the Daughters of Leucippe* at Munich should also be mentioned. See J. Rendel Harris's *The Dioscuri in the Christian Legends* (1903); and GEMINI.

**Castoridae.** See BEAVER.

**Castor Oil**, an oil expressed from the seeds of *Ricinus communis*, consisting mainly of the glycerol ester of ricinoleic acid ( $C_{17}H_{34}O_3$ ), and procured chiefly from Calcutta. It is almost without colour or smell, with a disagreeable acrid taste and a viscid consistency (sp. gr. '96). The dose is from a teaspoonful to two tablespoonfuls. It is seldom used pure externally, but is contained in flexible collodion and compound soap liniment. It acts as a simple purgative, stimulating peristalsis and the intestinal glands. It will also act when given as an enema. It enters the blood, and leaves the body by all the excretions, giving a purging action to mother's milk. Because of its simple, non-irritating effect, it is much to be recommended as a purgative for children. It can be given in capsules, but either they are large, or several are needed. Dr. John Thomson, in *Clinical Examination and Treatment of Sick Children* (1898), recommends shaking the dose up in a bottle, with a wineglassful of hot milk which has had cinnamon boiled in it. A simpler plan is to take a mouthful of dry meal immediately before the oil. If a lemon is squeezed into a glass and the oil poured on it, the oil will float and pass untasted on the lemon juice.

**Castra Bonnensia**, Rhineland. See BONN.

**Castration** (Lat. *castro*), the operation of removing the testicles of the male. One testicle may be lost through operation or disease without emasculation resulting. If the human male be castrated before puberty, he has no procreative power, and in several ways he approaches the feminine type. His beard is thin, or he has none; his voice is high-pitched and feminine, the thyroid cartilage remaining small, as in boys. On account of this effect on the voice, the operation of castration has been performed in Italy on professional singers. In Mohammedan countries it is commonly performed upon slaves, to make them safe guardians of the seraglio. When the operation is performed before puberty, it does not seem necessarily to affect the strength or stature. The writer has a vivid recollection of an African eunuch in the household of a Turkish pasha. He stood head and shoulders above a crowd, and spoke with a voice like a tin whistle. If castration is performed after puberty, there is often a lapse of some time before procreative power is lost. The sufferer shows progressive changes in voice and appearance, and there is considerable risk of mental degeneracy and melancholia.

**Castrén**, MATTHIAS ALEXANDER (1813-52), Finnish philologist, born at Tervola. The publication by Lönnrot of the *Kalevala* stimulated Castrén to study the Finnish language, and the first fruit of his labour was the treatise *De Affinitate Declinationum in Lingua Fennica* (1839). After a tour through Karelia, he published (1841) his Swedish translation of this great national epic. In 1842 he visited the land of the Syrjäns, a Finnish tribe between the Urals and the Pechora; and from 1845-9 participated in the Russian scientific expedition to Siberia, travelling among the



Ostiaks, Samoyedes, and Buriats, and studying their languages. In 1851 he was appointed the first professor of Finnish at Helsingfors. Among his works are *De Affixis Personalibus Linguarum Altaicarum* (1850). After his death appeared *Föreläsningar i Finsk Mythologi* (1853); *Ethnologiska föreläsningar öfver Altaiska Folken* (1857); *Tillfälliga Uppsatser* (1870), in which is contained Castrén's biography; *Grammatik und Wörterverzeichnis der Samojedischen Sprachen* (2 vols. 1854 and 1855). See *Life* by Snellman in his *Samlade Arbeten* (10 vols. 1892-1901).

**Castrense Peculium.** In early Roman law all acquisitions of a son under *patria potestas* belonged to the father. Augustus conceded to the *filius familias* the right to dispose by testament of his earnings on military service. This was the *castrense peculium*. The privilege was subsequently extended to all professional earnings, which were known as *quasi-castrense peculium*. If, however, the son died intestate, the father's right revived.

**Castres**, tn., dep. Tarn, France, 40 m. E. of Toulouse, with remains of a Roman camp, on the site of which, around a Benedictine abbey, the city was built (647). During the 16th century it was an important Huguenot stronghold, but was destroyed in 1629. Soap, leather, paper, and cotton goods are manufactured. Pop. 28,000.

**Castries**, or PORT CASTRIES, fort. tn. and port of entry on W. coast of St. Lucia, W. Indies. It is the capital of the island, and its harbour (British naval station) is one of the finest in the W. Indies. The exports include sugar, cacao, logwood, etc. Pop. 8,000.

**Castriot**, GEORGE. See SCANDERBEG.

**Castro**, tn., Asiatic Turkey. See CHIOS.

**Castro**, ALFONSO (c. 1495-1558), Spanish theologian and pulpit orator, was born at Zamora, and entered the order of St. Francis. He was chaplain to Philip II., and accompanied (1554) that monarch to England when he went to marry Queen Mary. During the latter part of his life he resided in the Low Countries. His chief work is a Latin treatise on *Heresies* (1534).

**Castro**, CYPRIANO (1863), ex-president of the republic of Venezuela, was born in the state of Los Andes. He is half white, half Indian (Andino), and is credited with great powers of oratory and debate. He first interested himself in local politics, and formed a party which went by the name of *Castristas*. But though he played a conspicuous part on the government side in the rebellion against President Palacio (1892), it was not until Andrade succeeded (1898) to the presidency that Castro leaped into a position of real power. Andrade soon degenerated into a despot, and in 1899 Castro took the field against him. He fought his way into the capital, Caracas, and Andrade fled to Curaçao. Castro assumed office as president on Oct. 24, 1899. He was elected constitutional president for a term of six years in February 1902, and in December of that same year embroiled his country with the Germans and British. He had a quarrel with the U.S.A. in 1905, and with France in 1906. In 1906 he voluntarily resigned the presidency for a time, but soon made a triumphal re-entry into Caracas. In 1908 he decided to go to Europe for his health, leaving the government in the hands of the vice-president, General Gomez. During his absence a Dutch cruiser seized a vessel of the Venezuelan navy—a reprisal for Castro's de-



liberate disorganization of Dutch trade in the W. Indies, and other offensive actions. There was a disturbance in Caracas, of which Gomez took advantage to assume the presidency 'provisionally,' securing the support of the European powers by promising reparation for the mischief wrought by his predecessor. Castro returned to find every port in the W. Indies barred against him, except Port de France, where the steamship company landed him, refusing to carry him any further. The French government then turned him out, and he was forced to return to Europe. General Juan Gomez became permanent president of Venezuela.

**Castro, INES DE** (d. 1355), a lady of noble Spanish family; came to Portugal (1340) as companion of her cousin, Costança de Paza, the betrothed of the Infante, Dom Pedro. In 1345, after the death of her cousin, Ines became first the mistress and then the wife of Dom Pedro. But Alfonso IV., the father of the Infante, gave orders that she should be murdered (1355). Dom Pedro came to the throne in 1357, and took terrible vengeance on the murderers.

**Castro, JOÃO DE** (1500-48), Portuguese captain and geographer, born at Lisbon. Going to the Indies (1545), he crushed the ruler of Cambodia, relieved the town of Diu (celebrated by Camoens), conquered Broach and Malacca, and sent his lieutenant, Antonio Moniz, to plant additional settlements in Ceylon. Castro was appointed viceroy (1547), but died the following year at Goa, nursed to the last by his beloved comrade, Francis Xavier. He left an account of the Red Sea, *Roteiro.....da Viagem ao Mar Roxo*, not published until 1833, though there was an English translation of this work under the title, *A Rutter of Don João of*

*Castro of the Voyage which the Portugals made from India to Zoez—i.e. Suez* (1625); *Roteiro da Costa da India* (1843); and *Roteiro de Lisboa a Goa* (1882). See *Life* by Jacinto Andrada (1651; Eng. trans. by Wyche, 1664).

**Castro del Rio**, tn., prov. Cordova, Andalusia, Spain, on r. bk. of the Guadajoz, 17 m. S.E. of Cordova. It has a Moorish castle and other ruins, and has some manufactures, and trades in cattle and grain. Pop. 12,000.

**Castrogiovanni** (anc. *Enna*) a fort. tn. and episc. see, prov. Caltanissetta, Sicily; is finely situated on the hollow summit of a hill (3,270 ft.), 13 m. (53 m. by rail) N.E. of Caltanissetta. It has a cathedral, founded in 1307, and an ancient citadel, and in classic times possessed a famous temple of Demeter, and another of Proserpine. Pop. 26,000.

**Castroreale**, tn., Sicily, prov. of and 20 m. W.S.W. of Messina; has hot mineral springs. Pop. (comm.) 10,000.

**Castro-Urdiales**, tn., prov. Santander, Spain, 17 m. N.W. of Bilbao; pretty fishing port on Bay of Biscay. Exports of iron ore (about 650,000 tons per annum), timber, and tinned sardines. Pop. 13,000.

**Castrovillari**, fort. tn., Calabria, Italy, prov. of and 36 m. N. of Cosenza; with trade in cheese, wine, and fruit. Pop. 11,000.

**Castro y Bellvis, GUILLÉN DE** (1569-1631), Spanish poet and dramatist, a friend of both Cervantes and Lope de Vega. Though lacking in invention, he is by many critics considered to have surpassed even Calderon in pathos. His best-known works are *Las Mocedades del Cid*, and its sequel, *Hazanás del Cid*, which was adapted to the French stage by Corneille, and was republished (1890) in a critical edition by Ernest Merimée. Castro's other works are *El Conde Alarcos*,



*Engañarse Engañando, El Perfecto Caballero, Pagar en Propria Moneda, Los Mal Casados de Valencia, and La Fuerza de la Costumbre.* See Lord Holland's *Life of Castro* (1817), Segall's *Cornelle and the Spanish Drama* (1902), and Martinenche's *La Comédie Espagnole en France* (1902).

**Castruccio-Castracani** (1281-1328), Italian general, born at Castruccio, near Lucca. He became a soldier in England (1301), France, and Lombardy. His townsmen recalled him and made him their leader (1314), whereupon he defeated the Guelphs, and joined forces with Ugucione, the Ghibelline leader of Pisa. In 1316 he became the governor of Lucca, and in 1325 inflicted upon the Florentines (who were Guelphs) a crushing defeat at Altopascio. When Ludwig v. of Bavaria went to Italy in 1327, Castruccio rendered him good service, for which he was appointed Duke of Lucca, Pistoja, Volterra, etc., and senator of Rome. His ideal was to found a great Ghibelline state in Tuscany, with Lucca as its capital. His *Life* by Machiavelli has all the character of a novel. See Manucci's *Azioni di Castruccio-Castracani* (1843), and Winckler's *Castruccio-Castracani* (1897).

**Castua**, tn., Istria, Austria, 6 m. N.W. of Fiume, was at one time the capital of Liburnia. Pop. (comm.) 18,000.

**Castuera**, tn., Spain, prov. of and 75 m. E. by S. of Badajoz; lead, iron, and copper mines. Pop. 6,500.

**Casualties** (Scots law), the rights of the superior of land to certain periodical or contingent payments. In the present state of the law they consist of—(1) Composition, the payment of a year's rent on the entry to the lands of any one but the heir; (2) Relief, a year's feu duty pay-

able by the heir on entry, in addition to the ordinary feu duty; (3) Irritancy of feus, by which, on the neglect of payment of the feu duty for two years, the land reverts to the superior.

**Casuarina**, the name given to a genus of tropical trees and shrubs with long, pendent, and leafless, though graceful branches. The jointed structure of the stems gives the trees somewhat the appearance of equisetums. They are valued for their hard wood. They may be grown under glass in ordinary garden soil, and are easily propagated by means of cuttings. The timber of some of the species is known as beefwood in New South Wales.

**Casuistry**, the science which deals with difficult cases of conscience—*i.e.* which undertakes to apply acknowledged principles of conduct to doubtful cases, or cases where there seems to be a conflict of duties. The science was developed systematically by the mediæval church in the 14th and 15th centuries. See Sidgwick's *Hist. of Ethics*, pp. 151 ff. (3rd ed. 1892); Bradley's *Ethical Studies* (1876).

**Casus Belli** (Lat. 'cause of war'). See INTERNATIONAL LAW.

**Cat**, generally the members of the mammalian family Felidæ. In such terms as civet cat it is also applied to animals outside the range of the family. The cat genus (*Felis*) includes the most highly specialized of the carnivores. The mechanism by which the claws are retracted reaches here its highest degree of perfection, and the sharp, compressed claws are themselves exceedingly powerful weapons. The teeth are only thirty in number, as compared with the forty-two of the dog; and of these thirty, two—the last cheek teeth in the upper jaw (molars)—are so small as to be practically functionless. The other cheek teeth are all sharp-



edged, and serve to cut off the large pieces of meat which are bolted by the animals without mastication. The tongue is roughened, and functions as a rasp. To this genus belong the large (lion, tiger, leopard, jaguar, etc.) and small (lynxes, wild cat, etc.) cats, often differing from one another chiefly in external characters.

The domestic cat is believed to have been derived from the Egyptian *F. caffra*, and not from the fierce wild cat (*F. catus*) of Europe, a larger and more powerful animal. In spite of prolonged domestication, the cat is less variable than the dog, and more prone to revert to a wild or semi-wild state. The chief variations are seen in colour, in regard to which there are some interesting points—compare the fact that pure sandy cats are always males. For a very full account of the structure and relations of the cat, see St. George Mivart's *The Cat* (1881).

The cat section (*Æluroidæ*) of the carnivores includes not only the true cats, or *Felidæ*, but also the civets (*Viverridæ*), the aardwolf (*Proteleidæ*), and the hyæna (*Hyænidæ*).

The Persian or long-haired domestic cat is the most popular and most 'fancied' breed. This variety is bred in many shades of colour. The most valuable of these is the pale self-silver or chinchilla, of a dull silver colour all over, with as little marking or shading as possible, and with green eyes. Blue Persians, or slaty animals approaching to a blue, should have a very level shade of colour all over, and very deep orange or amber eyes. The elegant pure whites with blue eyes are becoming again fashionable, and deep coal-blacks with dark-yellow eyes, creams, fawns, and orange-coloured Persians are gaining favour. Other shades of the long-haired variety are brown tabby,

silver tabby, tortoise-shell, and smokes. The tailless or Manx cat is supposed to have come originally from Japan. Other varieties of the kink-tailed cat are found in Madagascar and Abyssinia. Among the domesticated breeds of America may be mentioned the Paraguay cat.

The markings form more important points in judging the common or short-haired cats. A very interesting variety is the Siamese, said to occur in pure blood only in the palace of the king of Siam. It is of a pale cream colour, with feet, lower part of legs, muzzle, and ears all black. A fine all-blue cat comes from Russia and Iceland, and there are characteristic breeds from India, Abyssinia, and other parts of the world.

The earliest cat show in Britain was held in the Crystal Palace, London, in 1871; this is continued to the present day. The first held in Scotland opened in the Royal Gymnasium Hall, Edinburgh, a few years later. The National Cat Club was instituted, under the presidency of Mr. Harrison Weir, in 1887; and the club's annual exhibition, usually held in October, is still the show of the year. The Scottish Cat Club, formed in 1894, holds an annual show in Edinburgh or Glasgow. The Cat Club, instituted in 1898, follows the lines of the National; its annual exhibition is held in St. Stephen's Hall, Westminster. Among other societies are the Northern Counties Cat Club, which has its headquarters at Manchester, and holds usually two shows in the year, and the Midland Counties Cat Club, with headquarters at Wolverhampton, and yearly exhibition at Birmingham. See Champfleury's *Cats, Past and Present* (Eng. trans. by Mrs. Cashel Hoey (1885), Gordon Stables's *Cats* (1897), A. Replier's *The Fireside Sphinx* (1901), Landrin's *Le Chat*



(1893), and *The Book of the Cat* by Francis Simpson (1903).

*Diseases of Cats.*—These are in nearly all cases identical with the diseases of dogs. See Cherville's *Les Chiens et les Chats* (1888), Friedberger and Fröhner's *Veterinary Pathology* (new ed. 1904-5), F. T. G. Hobday's *Canine and Feline Surgery* (1900), and J. Woodroffe Hill's *Diseases of the Cat* (1901).

**Catacaos**, tn., Peru, dep. of and 10 m. s. by E. of Piura, on Rio de Piura; manufactures straw hats. Pop. (comm.) 20,000.

**Cataclysmal Action.** The geologists of the early part of the 19th century were much inclined to account for all that is remarkable in the rocks or in the geological structure of a country by ascribing it to the action of powerful forces, producing great catastrophes and tremendous upheavals in former geological periods, but now no longer in operation. These theories are now discredited, and an attempt is made to account for all geological phenomena by causes similar to those which we can see in action around us. This principle is sometimes known as uniformitarianism. See J. Hutton's *Theory of the Earth* (1795), J. Playfair's *Illustrations of the Huttonian Theory of the Earth* (1802), and Prestwich's *Controverted Questions of Geology* (1895).

**Catacombs**, the group of subterranean vaults and galleries in the neighbourhood of Rome, memorable as the sepulchres of the early Christians. But the name is also held applicable to the Baths of Cleopatra at Alexandria, and to the underground crypts, of exactly the same description as their Roman congeners, at Naples, Syracuse, Chiusi, and elsewhere.

The Roman catacombs consist of some forty or fifty groups of subterranean labyrinths of galleries and chambers cut out of

the soft stone (tufa) of the hills surrounding Rome. Some of them are comparatively near the surface of the earth; but beneath these, in the majority of cases, there are successive stories of greater depth, the lowest level being at a depth of seventy feet. The innumerable galleries run parallel to each other, or cross each other at right angles. If they could be added on to one another in a continuous line, they would stretch for a distance of 545 miles. And yet the estimated superficial area of the catacombs is only 615 acres. Passages are so narrow (from 1½ to 2½ ft. in width) in many cases, that it is impossible for two people to walk along them abreast, economy of space being clearly an important matter with the early excavators. The rocky walls on both sides of the passage have been hewn out into long tiers of niches or recesses, aptly compared to the berths in a passenger steamer, each niche or 'berth' having been made into a resting-place for a corpse. In some cases two bodies have been found in one niche. Each of the niches has been closed with a slab of marble or of terra-cotta, having the name of the deceased usually engraved upon it, with a pious legend attached. The language used in all the earlier inscriptions is Greek. All the later inscriptions, however, are in Latin. Eventually, in the 4th century, larger chambers were made, for the special purpose of holding religious services.

As the catacombs represent a fashion of burial previously followed by Egyptians and Jews, so the tombs of these Roman Christians present several pagan features. Ornaments, memorials, and domestic utensils are not infrequently found beside the dead body, for use in the future world, as in avowedly pagan burials. 'The arrangements of the tomb



of the Scipios and those of the Christian cemetery of Domitilla [in the Roman catacombs] are so similar,' observes Dr. Joseph Anderson, 'that if there had been nothing but the mere constructional features and sepulchral arrangements to guide us in forming an opinion, they would both have been assigned to one period and one origin. The catacombs of Naples contain frescoes of purely classical design, having nothing distinctively Christian about them.' (See *Proc. Soc. Antiq. Scot.*, vol. xi. pp. 366, 392.) In the catacomb of St. Prætextatus, Hermes is figured as the conductor of the dead. On the other hand, the frescoes of the catacombs are chiefly devoted to Scriptural themes. It is especially noteworthy that there are also Jewish catacombs in Rome. These were excavated about the 3rd century. They are, of course, devoid of all Christian symbolism, the seven-branched candlestick being their most frequent device. Their inscriptions are in Greek and Latin.

The most important of the catacombs are: St. Calixtus, with its *camera papale*, containing the tombs of martyred bishops of the 3rd century, and, in another part, Byzantine mural paintings of the 8th century; Domitilla, with 1st-century frescoes, and more than nine hundred inscriptions; St. Priscilla, with its frescoed Madonna of the 2nd century; St. Agnes, perhaps the most archaic specimen; San Sebastiano; St. Prætextatus at Syracuse, known as 'The Grottos of St. John,' and the subterranean necropolis of Sidon.

The catacombs ceased to be used as a burial-place after the sack of Rome by Alaric in 410, and during the middle ages their very sites seem to have been forgotten. The scientific researches of Antonio Bosio (d. 1629) and a

host of later students have, however, once more brought to light their actual characteristics and their historical associations. During the past generation the work of scientific explorers has greatly added to the number of ascertained catacombs; but the discovery, in 1901, of the catacombs beneath the Monte di Dio, in Naples, was entirely due to accident. See Bosio's *Roma Sotterranea* (1632), which has had several successors of the same name, notably that of Giambattista de Rossi (1822-94), and Northcote and Brownlow's *Roma Sotterranea* (1878-80). See also Mommsen's 'Roman Catacombs,' in *Contemporary Review*, vol. xvii. (1871); and Wilpert's *Le Pitture delle Catacombe Romana* (1905). The catacombs of Paris are subterranean quarries, from which the stone for building the city was obtained. In 1787 they were first utilized for storing the bodies removed from various burying-grounds.

**Catafalque**, a temporary erection, often magnificently draped, used at state funerals to serve as a trestle for the coffin.

**Catalan**, group of Romance languages largely spoken in the Spanish provinces of Gerona, Barcelona, Tarragona, Lérida, Valencia, Alicante, and Castellon de la Plana, as well as in the French department of Pyrénées Orientales and the Balearic Is. Catalan is an established language, with its own grammar and dictionary, and dating from the 13th century; it ranks in importance next to the Castilian, which is the official language of Spain. It is probably an offshoot of Provençal, and became a literary language between the 14th and the 16th century, attaining its zenith in the *Cants d'amor* and *Cants de mort* of Auzias March. Raymond Lully (d. 1315) and the historians Muntaner and Desclot



wrote notable Catalan prose, and Balaguer and Verdaguer are the poets of the Catalan revival, which dates from 1859. For language and literature, see Morel-Fatio, in Gröber's *Grundriss der romanischen Philologie*.

**Catalani, ANGELICA** (1779-1849), Italian singer, born at Sinigaglia, near Ancona. She made her *début* as a soprano at Venice (1795), and for some thirty years was almost unrivalled. Her voice was of great power, sweetness, and flexibility, with a compass which extended to G in altissimo. After singing at Lisbon (1801-6) she came to London, where she remained until 1814, when she went to Paris and assumed the direction of the Italian Opera. In 1816 she made a tour through Europe. In 1822 she appeared again in London, and although her voice had lost its former power, she still charmed her audiences.

**Catalaunian Fields**, the celebrated battlefield where the confederated peoples of Gallia, under the leadership of Ætius, defeated Attila, king of the Huns, in 451. It is generally considered to be the plain around Châlons-sur-Marne, though some authorities identify it with the plain round Metz, while yet others put it near Troyes.

**Catalectic Verses**, verses in which one of the normal number of syllables is omitted. Verses which contain the complete normal number are acatalectic.

**Catalepsy** is a functional nervous disorder, characterized in a typical case by loss of movement, of consciousness, and of sensation, together with a general lowering of all the vital functions. Although it may occur in either sex, it is far more common among women than men, and commonest among young women. Very often the cataleptic tendency can be traced to a certain definite date and cause. Suddenly, and usu-

ally without any premonitory symptom, the condition comes on. The patient falls silently, and becomes rigid in every limb, and at first it is extremely difficult to overcome the resistance of her muscles. She is apparently, and in all probability really, unconscious of everything, and insensible to pain, and the reflex movements are abolished to some extent. Later—and this is the characteristic of true catalepsy—the extreme rigidity of the muscles passes off, and the form can, as it were, be moulded. The arm, when bent to any position, yields readily, going just as far as it is taken, but not an inch on the patient's own initiative. In this condition of unconsciousness and flexibility the patient may continue for hours or days, apparently in an ordinary though deep sleep, except for the peculiar muscular condition. The breathing is shallow, the heart beats slowly and softly, and the temperature tends to fall rather below normal. The patient may rouse at intervals and go off again, or, suddenly coming to her normal condition, she may show nothing more of a cataleptic tendency. Often the recovery is at once complete. In some cases consciousness returns some time before speech.

*Treatment.*—Everything should be done to promote the general health. During the attack a policy of inactivity is the best, having recourse to artificial feeding if necessary.

**Cataloguing.** The conception of the cataloguing of books as capable of scientific treatment is due to Sir Anthony Panizzi, who drew up in 1839 his 'Ninety-one Rules' to be observed in compiling the catalogue of the library of the British Museum. The object of these rules was to provide for each book or pamphlet a



fixed heading under which it was to be entered and arranged in the catalogue, so that if another copy were offered, the fact that one was already in the library could be at once ascertained. The corner-stone of the system was that every book should be catalogued solely from the information which it contained itself, information obtained from books of reference or the librarian's private knowledge being added at pleasure, but not affecting the primary heading under which the book was entered. Panizzi's rules have since been modified to bring them more into harmony with the equally important principle that under the name of an author all the editions of his works should be shown in a single list, without the reader being obliged to look in any other part of the catalogue to find them. The British Museum Rules, as revised with this object, were reprinted in 1900, alternative systems having by that time already been put forward by the Library Association of the United Kingdom, the American Library Association, and C. A. Cutter (1st ed. 1876). Mr. Cutter's rules related specially to what is known as a 'dictionary catalogue'—*i.e.* one in which author, subject, and title headings are arranged in a single alphabet. This system has considerable advantages for small libraries, but only for these. In 1876 Mr. Melvil Dewey, of Columbia College, New York, drew up a scheme for the decimal classification of books in libraries, in which every subject was divided as far as possible into ten sections, and these, again, into decimal subdivisions, according to which the books were to be arranged on the shelves. This system, which has been largely followed, has revived in a new form the old mediæval class catalogues, the books being arranged in the catalogue in a more or less

logical sequence of subjects, with an index of authors. In subject indexes, such as those published periodically by the British Museum, books on the same subject are brought together; but the subject headings merely follow each other in alphabetical order. Card indexes are now largely superseding catalogues. See *London Library Subject Catalogue* (1910), and Nelson's *Standard Books* (1910-11).

**Catalonia**, an old principality and province in the extreme north-east of Spain. The Pyrenees form its base, and the Mediterranean Sea and Aragon its east and west sides respectively. The district is mountainous in character. Numerous streams traverse the valleys, and these, together with a well-managed system of artificial irrigation, render Catalonia the leading agricultural district of Spain. The coast-line is bold and rugged. The Ebro, the Llobregat, and the Ter are the chief rivers. The district has since 1833 consisted of the provinces of Gerona, Barcelona, Lerida, and Tarragona, with a total area of 12,483 sq. m., and a pop. of 2,000,000. Barcelona, the capital, is the second town in Spain; other towns of importance are Tarragona, Gerona, Lerida, Reus, and Manresa. The cork oak gives rise to a great industry, and large quantities of grain are grown, but it is as a manufacturing district that Catalonia has now risen into prominence. It has extensive manufactures of cotton, woollen, and silk goods, laces, leather, and paper. The minerals worked include coal, copper, zinc, lead, and tin.

Catalonia was the Hispania Tarraconensis of the Roman conquerors. In the 5th century it was overrun by the Goths and Alani. It was under Mussulman rule in the 8th century. In 1137 it was joined to Aragon, and the



two were in 1479 united to Castile; but the Catalans did not readily submit to loss of independence, and repeatedly revolted. After its conquest by Philip v., in 1714, it lost its separate constitution. There is still a Catalonian Separatist movement. See CATALAN.

**Catalpa**, a genus of trees, of the order Bignoniaceæ; two species of which are natives of the United States and two of Japan. The common catalpa (*C. bignonioides*), known also as the bean tree, catawba tree, trumpet tree, cigar tree, and Indian bean tree, is described under BEAN TREE. The Western catalpa, or Shawnee wood (*C. speciosa*), is a larger and more ornamental tree, and it yields useful timber. A West Indian species (*C. longissima*) yields a tannin.

**Catalysis.** Certain chemical reactions occur at vastly increased rates in presence of a third substance (often small in quantity), which itself remains apparently unchanged. This substance is known as the catalytic agent. In the preparation of oxygen from chlorate of potash, the addition of manganese dioxide causes the oxygen to be liberated at a much lower temperature, and much more rapidly. Deacon's process for the manufacture of chlorine is based on the use of cuprous chloride as a catalytic agent, and finely-divided platinum greatly accelerates the combustion of oxygen with hydrogen.

Other examples are, the decomposition of hydrogen peroxide by manganese dioxide and finely-divided platinum, and the reactions of hydrolysis of starch and of proteins, caused by the digestive enzymes, which act catalytically. No generally satisfactory theory of the action of catalysts is at present available. In certain cases catalysis depends on the continuous formation and decomposition of a second com-

pound from the catalyst—*e.g.* nitric oxide (NO) forms with air the peroxide (NO<sub>2</sub>), which parts with oxygen to convert sulphurous acid (H<sub>2</sub>SO<sub>3</sub>) to sulphuric (H<sub>2</sub>SO<sub>4</sub>), regenerating NO. In such cases the catalyst acts as a carrier or vehicle of oxygen or other active substance. In so far as catalysts act by accelerating the speed of reaction, their operation in this respect has been well compared with that of a lubricant in overcoming friction.

**Catamaran**, a raft used in the East, particularly by the natives of the Madras and Coromandel coasts. It consists of three pieces of wood lashed together, one of which serves as a keel, and the other two serve as sides. The rowers stand or kneel, and paddle with a bamboo. These craft, which sometimes carry sail, are able to live in almost any sea. When cross planks are fitted, cargo, and even ordnance, can be shipped or landed.

In the British navy an infernal machine or torpedo called a catamaran was used experimentally in 1804 in an attempt to destroy French shipping at Boulogne. It consisted of a lead-lined wooden chest, having a flat top and bottom and wedge-shaped ends; and it contained barrels of powder and clockwork machinery, and was so weighted as to float with its surface flush with that of the water. It had to be towed to its destination.

**Catamarca.** (1.) Province of the Argentine Republic, bordering on Chile. The country is mountainous, with summits rising to 19,000 and 20,000 ft., and large areas consist of salt desert and pathless forest. A fine quality of wine is produced, and tobacco and fruit are grown. The mines yield copper, silver, and gold. Area, 47,531 sq. m. Pop. 110,000. (2.) Capital of the above prov., about 250 m. N.N.W. of Cordoba;



picturesquely situated at the foot of the Ambato Sierra. The convent of San Francisco served for more than a hundred years as a university. Alt. 1,722 ft. Pop. 8,000.

**Catamount.** See PUMA.

**Catanduanes**, a fertile isl., Albay prov., Philippines, separated from the E. coast of Luzon by Maqueda Channel. Area, 710 sq. m. Pop. 40,000. Abaca, rice, sesame, corn, cotton, and indigo, are raised. Gold is found in the river sands. Birac, the chief tn., is 230 m. E.S.E. of Manila.

**Catania.** (1.) Province of Italy, occupies the middle of the E. side of Sicily. Mount Etna fills its N.E. quarter, and S. of it is the fertile plain of Catania, drained by the Simeto. Behind these two regions the country is mountainous (2,250 to 4,000 ft.). It yields wheat and olives, as well as wine, fruit (oranges, lemons, etc.), sulphur, and silk, cotton, and silicate of soda are manufactured. Area, 1,917 sq. m. Pop. 750,000. (2.) Town and episc. see, cap. of above prov., at foot of Mt. Etna, 59 m. by rail S.W. of Messina. A place of residence for Sicilian magnates, the seat of a university (about 900 students) and a famous academy of natural sciences; it is also one of the chief Sicilian seaports, exporting sulphur, fruits (oranges and lemons), oil, wine, etc., and importing coal, cereals, and vegetable produce, hides, skins, etc. There is a double harbour (20 to 23 ft. water). Cottons, silks, bent-wood furniture, hats, soap are manufactured; olive oil is distilled, and sulphur refined. The town has suffered from disastrous earthquakes on several occasions. Pop. 200,000. The Greek colony of Catana was founded in 730 B.C. by the Naxians. Hiero took it (476), and settled it anew, with the name of *Ætna*.

**Catania, GULF OF**, inlet of the Ionian Sea, on the E. coast of Sicily, extending from near Acireale in the N. to Agosta in the S.; about 20 m.

**Catanzaro.** (1.) Province of S. Italy; occupies the middle of the Calabrian peninsula, and previous to 1871 was called Calabria Ulteriore II. The mountainous parts (La Sila) are mostly covered with forests, and cattle-grazing is one of the chief occupations. Corn, wine, olives, fruits, and silk and velvet are the principal products. Area, 2,030 sq. m. Pop. 490,000. (2.) Town and episc. see of Italy, cap. of above prov.; 110 m. by rail N.E. of Reggio di Calabria. The town is a favourite place of residence for wealthy Calabrians. It was partly destroyed by earthquake in 1783. Pop. 32,000.

**Catapult**, an engine for hurling projectiles, first used as an implement of war by the ancient Romans. The larger kind were mounted on a strong wooden platform, the trigger or projector was drawn back by ropes, and then held by a catch, while the missile was placed on it prior to letting it fly. The smaller implements were carried in the hand, and used for discharging javelins, darts, etc., at close quarters. In an elastic catapult the elastic should be  $\frac{1}{8}$ th in. thick and 9 in. long; the pouch should be made of dogskin, and the fork of privet. No. 1 shot is the most serviceable. This instrument is by no means a mere toy for schoolboys, as it is often supposed to be. Many sportsmen carry an elastic catapult when out shooting big game. By its use they are able to replenish their larder without wasting ammunition or disturbing the larger game by a rifle. In the Rocky Mountains the grouse can always be shot with a catapult.

**Cataract** is any opacity of the crystalline lens of the eye.



with consequent diminution of vision, varying from mere dimness to a total blindness to everything save the difference between light and darkness. Cataract may occur at any age, and from various causes. It may be congenital or juvenile, traumatic (*i.e.* resulting from violence), secondary to other eye-disease, or primary; and it may be senile—*i.e.* resulting from degenerative changes not associated with any definite disease, but apt to occur after middle age has passed. Senile cataract is usually found in both eyes, though one eye may be much earlier affected than the other. The immediate cause of cataract is in most cases not known. In congenital cases it tends to be associated with rickets and other disorders of nutrition. In some other cases, particularly in juvenile cataract, which is not congenital, it is the result of an injury, often a small punctured wound. It may also be secondary to degenerative changes which start in other parts of the eye and spread to the lens. It is believed that the structure of the lens renders it peculiarly liable to suffer from slight failure of nutrition.

*Diagnosis.*—When the cataract is advanced, a gray cloudiness of the pupil can be seen with the naked eye; but if it be only incipient, examination with the ophthalmoscope is necessary to detect it. The rate of development varies greatly. From two to three years is considered the average time for a senile cataract to 'ripen'—*i.e.* to cover the lens and prevent the distinguishing of more than light from darkness.

*Treatment.*—The ultimate treatment of cataract is in most cases operation. Until operation is deemed advisable, the eye can in some cases be made more serviceable by the use of weak 'mydri-

atics'—*i.e.* pupil-dilators; in others, specially constructed glasses add to the comfort; in yet others, though rarely, the use of 'miotics'—*i.e.* pupil-contractors—is of service. Operations are 'discission,' or needling, and 'extraction.' Discission is used for young people only, in whom the cataract is soft. A needle is inserted at the corneo-sclerotic junction, and the anterior surface of the capsule is opened. The substance of the lens is then stirred, until, gradually passing out into the aqueous humour which lies in front of the capsule, it is slowly absorbed. Extraction is performed by making an incision across the upper corneo-scleral margin; the capsule is opened anteriorly, and the lens lifted and pressed out. Both operations are, of course, performed with every antiseptic precaution.

**Catargi**, LASCAR (1823-99), Roumanian statesman. Under Prince Charles he was Conservative prime minister in 1866, 1871-6, 1889, and 1891-5, besides holding portfolios in various combination ministries. During his last premiership (1891-5) some important measures were passed, such as the conversion of the public debt, the settlement of the peasantry on state land under a scheme of peasant-proprietorship, and the establishment of a state agricultural bank.

**Catarman**, pueblo on N. coast of Samar I., Philippines, 55 m. N.N.W. of Catbalogan. The tn. was destroyed in 1871 by a volcanic eruption. Pop. 10,000.

**Catarrh** (Gr. 'down-flow'), an early stage in the inflammation of mucous membranes, attended by increased discharge from their surfaces, as shown in a common cold, which is accompanied by catarrh of the nasal mucous membrane.

**Catarrhini**, the name formerly given to the dog-faced monkeys



and anthropoid apes of the Old World, as contrasted with the flat-nosed (platyrrhine) monkeys of the New World. The term *Catarrhini* is now dropped, as the Old World monkeys (*Cercopitheciidæ*) are recognized as differing in many points from the anthropoid apes (*Simiadae*), and are placed in a separate family.

**Catarroja**, tn., Spain, prov. of and 5 m. s. by w. of Valencia, near Lake Albufera. Pop. 7,000.

**Catauxi**, a numerous and warlike cannibal people of W. Brazil, about the Madeira, Purus, Jurua, and Teffé rivers. They go naked, wear bangles of twisted hair on wrists and ankles, use the blow-pipe and poisoned arrows in war and the chase, but also till the land, grow fine crops of manioc, and make excellent pottery ornamented with geometrical designs.

**Catbalogan**, cap., Samar I., Philippines, on the w. coast, 330 m. s.e. of Manila. It is a port of call for Manila steamers, and carries on a large trade in hemp and cocoanut oil with that city. Pop. 8,000.

**Cat-bird**, a name applied to two distinct passerine birds—to the American *Galeoscoptes carolinensis*, a member of the thrush family (*Turdidæ*), and to the Australian *Elureduis viridis*, one of the birds of paradise (*Paradisidæ*). The former is one of the American mocking-birds, which have long bills and dull-coloured, thrush-like plumage; the latter is of a bright-green colour, with blue and white markings. It is one of the bower-birds, but does not construct true 'bowers,' though the 'playgrounds' are decorated with bright-coloured objects.

**Catch**, a form of musical composition written for three or more voices in canon form. (See also **ROUND**.) It is peculiar to England, and was much practised

during the reign of Charles II. The London Catch Club was formed in 1761, and still flourishes.

**Catch - as - catch - can.** See **WRESTLING** (3).

**Catchfly**, a large genus of caryophyllaceous plants, of which many are of garden value. They are characterized by a gamosepalous calyx, ten stamens, and three or four styles. Among the most beautiful may be named *Silene alpestris*, a dwarf, perennial, hardy, white-flowering kind, which blooms in May, and is specially suited for the rock border. *S. pendula* and its variety *compacta* bear pinkish flowers throughout the summer. This species is a hardy annual, very vigorous in habit. *S. acaulis* is a dwarf alpine plant, which bears rose-coloured flowers in June and July; it is found as a rare native in Britain. *S. schafta* is a Persian species, about five inches in height; it bears purplish flowers in autumn. *S. vespertina* is an annual species; its rose-coloured flowers yield a slight fragrance at night. This night-blooming and night-scented habit is much more marked in *S. noctiflora*, a British species which bears yellow-and-pink flowers in late summer. The American wild pink, *S. pennsylvanica*, is a perennial species, bearing pinkish flowers in May.

**Catching Bargain**, bargain made with an heir, reversioner or expectant, for the purchase of his interest in expectancy or reversion. Under certain conditions the court will grant relief to the heir or reversioner. See **REVERSION**.

**Catchment Area**, or **DRAINAGE BASIN**. See **RIVER**, and **WATER-SUPPLY**.

**Cateau-Cambrésis**, now **LE CATEAU**, manufacturing town, dep. Nord, France, 16 m. E.S.E. of Cambrai. The town rose slowly round the ancient palace of the



archbishop of Cambrai, now turned into a factory. Textiles are spun and woven, sugar is refined, and the other industries include brewing, metal-founding, and mosaic work. Marshal Mortier was born here; and here also was signed the treaty of 1559 between France, England, and Spain. Pop. 10,700.

**Catechism**, a treatise drawn up for teaching purposes in the form of question and answer. The word has not in itself any exclusively theological reference, and there are such things as scientific or political catechisms; but popular custom confines the term to religious works of the required form. The first catechisms were no doubt drawn up for the guidance of catechumens or candidates for Christian baptism, and were probably very short. The longer treatises of later date are connected with special movements for the spread of religious knowledge among the people. Thus, in the 8th and 9th centuries, men like Otfried of Weissenburg in Alsace, and Kero and Notker Labeo of St. Gall, prepared catechisms which were largely used as instruments of popular education. The Waldenses, the Albigenses, the Wycliffites, and the Bohemian Brethren were all very active in the production of catechisms. Naturally, a movement like the Reformation was fertile in the same direction. Luther, besides a short Primer (1520), published a Larger and a Smaller Catechism in 1529. A notable catechism was that of Brenz (1527-8). Calvin also issued a Smaller Catechism (1536) and a Larger (1541). Calvin's catechisms have been superseded, even in the Swiss Church, by the catechism of Heidelberg, compiled by Caspar Olevianus and Zacharias Ursinus (1563). This was revised and authorized by the Synod of Dort (1619), and is ac-

cepted by the German and Dutch Reformed Churches at home and abroad. Dissent and reaction from reformed doctrine have also produced catechisms. The Socinians adopted a Larger and a Shorter Catechism at Racow in Poland (1605). The Quakers, besides one attributed to Fox (1660), have that of Barclay (1673). In the Church of Rome a catechism was drawn up by instruction of the Council of Trent, and, after several revisions, was finally accepted in 1566. This was rather a theological treatise than a catechism proper, and has been superseded in popular use by the Longer and Shorter Catechisms of Peter Canisius (1554 and 1556). Other Romanist productions are the catechism of Bellarmine (1603) and of Bossuet (1687). The *Schema de Parvo*, a summary of Bellarmine's, was sanctioned by the Ecumenical Council of 1870. In the Greek Church, Peter Mogilas, metropolitan of Kiev, drew up a catechism about 1640; but those now in use are the catechisms of Platon (1762) and Philaret (1839), both metropolitans of Moscow. In England, the best-known catechism is that which is found in the Book of Common Prayer. It is in two parts, of different dates. The first, containing the baptismal covenant, the creed, the commandments, and the Lord's Prayer, was drawn up in the reign of Edward VI. The latter part, containing the doctrine of the sacraments, was written on the suggestion of James I. at the Hampton Court Conference in 1604. It is attributed to Dean Overall. A Larger Catechism, which seems to correspond to the first part of that now in use, had been published in Edward VI.'s reign. It was afterwards extended (1570) by Dean Nowell. In this form it was thought too long for practical purposes, and accordingly, as above stated, the



previous Shorter Catechism was supplemented. This is adopted (sometimes with modification) by Episcopal Churches everywhere. In Scotland, the best-known catechisms are those of Craig, which was authorized by the Assembly in 1592, and the Larger and Shorter Catechisms, authorized in 1648. The Shorter is the only one now in general use. It is a clear and powerful statement of the Calvinist position, often in phrases of great majesty and beauty. See Niemeyer's *Collectio Confessionum* (1840); Schaff's *Hist. of the Creeds of Christendom* (1876).

**Catechu**, PALE, is an extract prepared from *Uncaria gambier*, a climbing shrub found in the Malay Archipelago. It is made from the leaves and young shoots of the plant, and comes into the market in dry cubes about one inch square. It tastes at first bitter and astringent, but afterwards sweetish, and is used in medicine as a local astringent in the form of a lozenge, or as a general astringent in diarrhœa; but its chief use is in the dyeing and tanning industries. There is another substance closely related to this, termed Black Catechu or Cutch, which is an extract prepared from the heartwood of *Acacia catechu*, a tree common in India. The latter substance is not used in medicine, but only in dyeing and tanning. To prevent confusion, the term 'gambier' should be given to the former, and 'cutch' to the latter.

**Catechumen**, one who is taught by word of mouth. Candidates for baptism were so called by the early church. They were divided into four classes: (1) *Inquirers*, who were instructed privately; (2) *Audientes*, or hearers, who, being sufficiently advanced, were admitted to the *Missa catechumenorum*—those left after the gospel and sermon; (3) *Prostrati*,

or *orantes*, or *genuflectentes*, who shared in the worship of the congregation; (4) the *Electi*, or *competentes*, who were ready and desirous to be baptized. This fourfold division is not, however, strictly demonstrable during the early period. (See Moeller's *History of the Christian Church*, i. Eng. trans. 1892.) Owing to the dread of post-baptismal sin, many persons remained in the third class until the near approach of death.

**Categorical**. A categorical judgment is contrasted as one which 'asserts an actual fact absolutely' with a hypothetical judgment, which 'asserts only the consequence that follows upon a supposition.' On the question whether this distinction is to be taken as absolute, or only as a distinction between two characters that pertain in varying degrees to all judgments, see B. Bosanquet's *Knowledge and Reality*, ch. i. (1885), and the same writer's *Logic*, vol. i. pp. 94-96 (1888).

**Categorical Imperative**. Kant's technical term to signify the unconditional law of duty, as contrasted with a command which is valid only under the supposition of an already accepted end. For example, the categorical law, 'Thou shalt not promise deceitfully,' becomes merely hypothetical if it is obeyed only in order that the agent's credit may not be injured; for the agent's interest is then the really determining ground of his action, and he no longer observes the law simply as a law of duty.

**Category**, a term in logic and philosophy. Its most important special uses are the Aristotelian and the Kantian.

The Aristotelian doctrine of the categories is a classification of the kinds of predicates—i.e. of the different kinds of assertions that may be made about a sub-



ject. These categories are ten in number, the first and fundamental being that of substance, the others adjectival predicates applicable to a thing or substance—viz. quantity, quality, relation, place, time, situation, possession, action, and passion.

Kant uses the term category to signify the conceptions under which, according to his theory, we must think phenomena—*e.g.* phenomena as events in time must be brought under the category of cause and effect. (See KANT.) His table of categories consists of four groups of three each—the categories of quantity (viz. unity, plurality, totality), the categories of quality (viz. reality, negation, limitation), the categories of relation (viz. substance, causality, reciprocity), the categories of modality (possibility, existence, necessity). Kant's categories refer only to phenomena—*i.e.* to sense experience, or, roughly speaking, to the objects of physical science. By later thinkers the term has been extended to cover any fundamental and necessary conception under which reality, whether physical or otherwise, must be thought; and thus Hegel's logic or system of categories is a metaphysic which is universal in its range. (See HEGEL.)

**Catena**, properly VINCENZO DI BIAGIO (c. 1471–1531), Italian painter of the Venetian school, a pupil of Giovanni Bellini. Though a great portrait painter, he also excelled in historical subjects. Later he imitated Giorgione. Typical examples of his fine portraits are *Count Raymond Fugger*, a patient rendering of pallid flesh (Berlin Museum), and a superb *Knight kneeling before the Madonna* (National Gallery). His religious and historical work may be seen in the Venetian churches, Academy, and Doge's Palace.

**Catenary**, in mathematics, is the curve assumed by a uniform flexible chain or rope when suspended from two points, and hanging freely under the influence of its own weight. Since by suitably varying the distribution of weight along a chain we may make it hang in the form of any assigned curve, which then becomes a special form of catenary, it is usual to distinguish the catenary in which the uniform chain hangs as the common catenary. As a curve it has many interesting properties, being one of the few curves for which the length of arc between two points can be expressed in terms of the positions of the points. Also, the area bounded by the arc, by the vertical lines through the extremities, and by the horizontal line which cuts across them, can be expressed by means of a simple formula. If this horizontal line is drawn at a particular distance below the lowest point of the catenary, it can be shown that the height of any point of the curve above this line is the length of chain whose weight would be equal to the tension in the hanging chain at the point chosen. Then the area bounded by the vertical line through the lowest point of the catenary, and the vertical line through the extremity of any chosen arc, is equal to the length of arc multiplied by the height of the higher extremity of the arc above the horizontal line. This particular horizontal line is called the directrix. If the chain is loaded in such a way that the weight of any part is proportional to the horizontal projection of the part, the chain will hang in a parabola. This is the particular form of catenary assumed by the supporting chains of a suspension bridge, in which the load is practically the roadway distributed uniformly in a horizontal direction, the weight



of the supporting chain being negligible in comparison. The equation of the common catenary in cartesian co-ordinates is  $y = a \cosh \frac{x}{a}$ .

**Caterham**, par. and vil., E. Surrey, England, 7 m. s. of Croydon. Pop. 10,000.

**Caterpillar**, the name given to the larvæ of lepidopterous insects. A caterpillar is a somewhat wormlike animal, with a distinct head, bearing strong mandibles, simple eyes, and short antennæ; a thorax, consisting of three segments, each furnished with a pair of jointed legs; an abdomen, consisting of ten segments, though some of these may be indistinct, and bearing a variable number of unjointed 'false legs' or 'pro-legs.' The last of these are specially modified, and are called claspers. Internally the caterpillar displays a capacious stomach, rudimentary generative organs, and the peculiar silk-glands which open on the head and spin the threads used in forming the cocoon. Caterpillars are usually more or less sedentary—compare the imperfect sense organs and absence of wings—and as they are exceedingly voracious and expend but little energy, they store up within their bodies large supplies of food. It is these supplies which are used up during the process of conversion into the adult (*imago*), and as the adult takes but little food, it is they also which provide the stores necessary for the production of the numerous eggs. But the caterpillar's remarkable powers of assimilation render it peculiarly liable to the attacks of parasites (ichneumons), which, by reason of the reserves within the body, can go on living at the expense of their host, without producing any apparent injury during larval life. When the caterpillar's powers of assimilation are reached it ceases to

feed, and passes into the pupa state. As the parasites have devoured the stores which should have supported it during this quiescent period, death ensues. Numerous caterpillars are destroyed in this way, so that the ichneumons are really useful insects, in that they keep down the numbers of their destructive hosts.

Caterpillars are very variable in colour and markings, and while some, such as the common cabbage caterpillars, are apparently only coloured by half-digested food, others are remarkable for their bright tints or their elaborate armature of hairs or spines. Those—such as the larvæ of the clothes-moth (*Trichophaga*) and the codlin-moth (*Carpocapsa*)—which live concealed are often very maggot-like, though structurally caterpillars. For British caterpillars, see *The Larvæ of British Butterflies and Moths*, by W. Buckler, 8 vols. (1886).

**Catesby**, MARK (?1679-1749), English naturalist and F.R.S., born and died in London. After travelling in N. America (1710-19) he returned to England with a collection of plants. Again he travelled to Carolina (1722-6). He published *Natural History of Carolina, Florida, and the Bahama Islands, with Observations on the Soil, etc.* (1731-43).

**Catesby**, ROBERT (1573-1605), English conspirator, born at Lapworth, Warwickshire. In 1604 he joined Thomas Winter and Guy Fawkes in the Gunpowder Plot (Nov. 4, 1605), and escaping to Holbeach, Staffordshire, was there shot dead. See GUNPOWDER PLOT, and Jardine's *Narrative of the Gunpowder Plot* (1857).

**Cat-fish** (Siluridæ), a family of bony fishes in which the skin is either naked or furnished with bony plates; barbels are present about the mouth, and the air-bladder, when present, communicates with the ear by means of





*Types of Caterpillars.*

1. *Papilio machaon*. 2. *Polyommatus Adonis*. 3. *Thanaos tages*. 4. *Hipparchia semele*.  
 5. *Odonestis potatoaria*. 6. *Callimorpha Jacobææ*. 7. *Deilephila euphorbiæ*. 8. *Acherontia*  
*stropes*. 9. *Acronycta Psi*. 10. *Cossus ligniperda*. 11. *Trochillum sphegiformis*. 12. *Vanessa*  
*la*. 13. *Argynnis adippe*. 14. *Polyommatus alsus*. 15. *Thecla betulæ*. 16. *Abraxas grossu-*  
*lariata*. 17. *Cerura vinula*. 18. *Ourapteryx sambucata*.



auditory vesicles. The skeleton shows many peculiarities: for example, the pectoral girdle is modified so as to give strength and mobility to the spine with which the pectoral fin is usually armed. Some notable cat-fishes are the 'wels' (*Silurus glanis*) of the Germans, a large fresh-water fish, found in certain of the rivers of Europe; the 'electric cat' (*Malapterurus electricus*) of Africa, the species of *Doras* and *Callichthys* from America, and others.

**Catgut**, the material used for violin, guitar, and harp strings, for stringing rackets, and other similar purposes, is commercially obtained, not from the small intestines of the cat, but from those of the sheep, and also, for the rougher purposes, from those of the horse. The intestines are cleaned, then soaked in water until the external membrane can be scraped off; this, which the French call *filandres*, is used for rackets. The inner membrane of the small intestines is steeped in an alkaline solution of potash, and is then drawn through holes in a metal plate or thimble, to regulate the thickness and to ensure the circular section.

**Cathari**, a sect of Gnostics who called themselves Katharoi, or Puritans. They held that matter is intrinsically evil, and the source of all evil; that the Supreme Being was not the creator of this world; that Christ had not an actual body, nor could He be said to have been really born or to have died; that men's bodies are evil, and the product of the evil principle. They professed to accept the New Testament. They aimed, by an ascetic life, to set themselves free from the control of the body; and the more advanced disciples abjured all animal food, as well as wine and marriage. The Cathari originated in the Balkan Peninsula, and had their chief

strength there, in Italy, and in the south of France. They were also known as Paulicians, Bulgarians, Patarenes, and were frequently confounded with the Albigenses, with whom their views were practically identical, suffering severely in the persecutions of the last. See C. Schmidt's *Histoire et Doctrine... des Cathares* (1849).

**Cathartics.** See MATERIA MEDICA.

**Cathay** is the name given by Marco Polo to the Chinese empire; it is derived from Khitan or Khitai, which designates several Mongolian tribes who conquered the northern part of China and ruled over it till 1123.

**Cathcart**, par. and tn., Renfrewshire and Lanarkshire, Scotland, 3 m. s. of Glasgow, of which it forms a s. suburb. Pop. 30,000.

**Cathcart**, dist. and tn. in the s.e. prov. of Cape of Good Hope, 109 m. by rail N.W. of E. London. Pop. of dist. 12,000; of tn. 1,700.

**Cathcart**, CHARLES MURRAY (1783-1859), second Earl Cathcart, English general, born at Walton, Essex; served in Naples and Sicily in the campaigns of 1805-6, and in the disastrous Walcheren expedition of 1809. He greatly distinguished himself in the battle of Waterloo. In 1841 he discovered a new mineral (called, after the family title, greenockite), and is author of *The Coal Formation of the Scottish Lowlands* (1836).

**Cathcart**, SIR GEORGE (1794-1854), English general, brother of the preceding. He served with the Russians as aide-de-camp in the campaigns of 1813 and 1814, and under Wellington at Quatre Bras and Waterloo. He assisted in suppressing the Canadian rebellion (1837). In 1852 he was appointed governor and commander-in-chief at the Cape, where he finished the Kaffir war. Appointed adjutant-general